



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

MAY 02 2018

Ms. Deborah Chin
Executive Director – PTC
Long Island Rail Road
144-41 94 Avenue Mail Code 1913
Jamaica, NY 11435

Re: Long Island Rail Road's Proposed Alternative Schedule for Advanced Civil Speed Enforcement System II on the Harold Interlocking (Docket Number FRA-2010-0031)

Dear Ms. Chin:

The Federal Railroad Administration (FRA) has received Long Island Rail Road's (LIRR) December 22, 2017, proposed alternative schedule for the Harold Interlocking East Side Access (ESA) project, Revision A. This request was originally submitted on October 6, 2017, and subsequently revised as a result of a joint field survey conducted by FRA, LIRR, and the LIRR positive train control (PTC) system integrator.

The ESA project, a major system expansion, will create a new connection between Grand Central Terminal in midtown Manhattan, NY, and LIRR's major interlocking complex in Queens, NY, known as Harold Interlocking. The Harold Interlocking reconfiguration requires major shifts in the current physical infrastructure and installation of new interlocking track and interlocking signaling that will require over five calendar years to complete. Multiple construction stages are required to implement this reconfiguration. LIRR asserts that the current ESA project will not achieve a stable configuration for the existing train movements through the interlocking until the end of October 2018, and the ultimate final infrastructure configuration will not be completed until April 2023. The identified stages and their anticipated completion dates are as follows:

- | | |
|--------------------|----------------|
| • Stage 2F | Current Layout |
| • Stage 2I | May 2018 |
| • Stage 2J | May 2018 |
| • Stages 3A and 3B | August 2018 |
| • Stages 3C and 3D | October 2018 |
| • Stage 4B | August 2020 |
| • Stage 4C | October 2020 |
| • Stage 4D | April 2023 |

Based on this project construction schedule, LIRR anticipates that PTC system testing and commissioning of Harold Interlocking to support existing train movements will not commence until after the completion of stages 3C and 3D, and that the PTC system will not be operative for the physical infrastructure corresponding to stages 3C and 3D in this area until June 2019. As this date is past the statutory PTC implementation deadline of December 31, 2018, an alternative schedule for implementation in accordance with 49 U.S.C. § 20157(a)(3)(A)–(D) is required.

FRA notes that per LIRR’s current FRA-approved Positive Train Control Implementation Plan (PTCIP), Revision 4.0, dated January 31, 2018, LIRR will have PTC implemented on all other required territories except this interlocking project. As FRA discussed with LIRR leadership on January 11, 2018, it is likely that LIRR will need to request an alternative schedule for implementation of its PTC system on all LIRR main lines that are subject to the statutory mandate (not only the Harold Interlocking ESA project), as full implementation requires that an FRA-certified¹ and interoperable² PTC system—including all hardware, software, and other components—has been fully installed and is in operation on all route miles required to have operations governed by a PTC system under 49 U.S.C. § 20157.³ Full implementation requires that all controlling locomotives shall be equipped with an onboard PTC apparatus that is fully operative and functioning in accordance with LIRR’s PTC Safety Plan (not yet submitted to FRA for review and approval), except the controlling locomotives that qualify for an exception under 49 CFR § 236.1006(b) as identified in LIRR’s PTCIP.

LIRR may revise its FRA-approved PTCIP, Revision 4.0, dated January 31, 2018, to include its proposed alternative schedule for the Harold Interlocking ESA project and any other required main lines, and FRA recommends the following amendments based on LIRR’s December 22, 2017, letter:

1. In accordance with 49 U.S.C. § 20157(a)(2)(B), LIRR must revise its current approved PTCIP with an FRA-acceptable alternative schedule that provides for implementation as soon as practicable, but no later than December 31, 2020, for, at a minimum, the segments of track directly associated with the ESA project.
2. Consistent with LIRR’s December 22, 2017, letter, the proposed plan should reflect that:
 - a. All PTC system hardware shall be installed, by December 31, 2018, on all existing Harold Interlocking routes on which LIRR and Amtrak operate.

¹ See 49 U.S.C. § 20157(h)(1); 49 CFR §§ 236.1009(d), 236.1015.

² As defined by the statutory mandate, interoperability means “the ability to control locomotives of the host railroad and tenant railroad to communicate with and respond to the [PTC] system, including uninterrupted movements over property boundaries.” See 49 U.S.C. § 20157(a)(2)(A)(i)(I), (a)(2)(D), (i)(3); 49 CFR §§ 236.1003, 236.1011(a)(3).

³ The Positive Train Control Enforcement and Implementation Act of 2015 recognizes that certain PTC system failures (e.g. initialization failures, cut outs, and malfunctions) will occur during the period specified in the statute, but a railroad must both operate at an equivalent or greater level of safety than the level of safety achieved immediately prior to the use or implementation of the PTC system and comply with certain safety measures during any PTC system failures. See 49 U.S.C. § 20157(j).

- b. Harold Interlocking route modifications made after completion of stages 3C and 3D and prior to December 31, 2020, must have all PTC hardware installation completed prior to the use of the route. The PTC system must be fully operational on these routes by December 31, 2020.
 - c. By June 31, 2019, the PTC system must be operational on all active routes through the Harold Interlocking configuration established during stages 3C and 3D.
 - d. The PTC system must be in operation on any route modifications to Harold Interlocking made after December 31, 2020, at the time of their commissioning.
3. ESA Construction Zone transponders must be verified and validated to be effective so that they do not interfere with normal PTC revenue service operations for both LIRR and Amtrak.

The revised PTCIP with LIRR's proposed alternative schedule should be submitted to FRA within 90 days of this letter.

However, please note that, at this time and until LIRR submits a formal written notification to FRA under 49 U.S.C. § 20157(a)(3)(A), FRA cannot approve LIRR's request for an alternative schedule for implementation of its PTC system on the Harold Interlocking ESA project. The congressional PTC mandate does not authorize FRA to approve an alternative schedule, unless a railroad submits a written notification to FRA that demonstrates it has met all statutory criteria under 49 U.S.C. § 20157(a)(3)(B). Specifically, to qualify for FRA approval of an alternative schedule, a railroad must demonstrate, in its written notification, that it has met the following statutory criteria:

- Installed, by December 31, 2018, *all* PTC system hardware that will be installed for PTC system implementation, consistent with the railroad's governing PTCIP;
- Acquired, by December 31, 2018, all spectrum necessary for implementation of the railroad's PTC system, consistent with the railroad's governing PTCIP;
- Completed the employee training required under 49 CFR part 236, subpart I for all applicable personnel in any territory, or segment thereof, where the PTC system is currently being operated in RSD or revenue service;
- Advanced Testing and/or Implementation:
 - For Class I railroads and Amtrak, the railroad has implemented a PTC system or initiated FRA-approved RSD on the majority of territories (e.g., subdivisions or districts) or route miles the railroad owns or controls that are required to have operations governed by a PTC system;
 - For other railroads (i.e., not Class I railroads or Amtrak), the railroad has initiated FRA-approved RSD on at least one territory that is required to have operations governed by a PTC system, or met any other criteria established by FRA;
- Included in its PTCIP an alternative schedule and sequence for implementing a PTC system as soon as practicable, but no later than December 31, 2020; and

- Certified to FRA in writing that it will be in full compliance with 49 U.S.C. § 20157 on or before the deadline in the proposed alternative schedule and sequence.⁴

This letter does not constitute FRA approval of LIRR's alternative schedule. To obtain FRA approval of its proposed alternative schedule, LIRR must submit a written notification to FRA when it is prepared for FRA review under 49 U.S.C. § 20157(a)(3)(A) and demonstrate it has met all statutory criteria under 49 U.S.C. § 20157(a)(3)(B)(i)–(v) and (vii).

If you have any questions regarding this letter, please feel free to contact Ms. Carolyn Hayward-Williams, Staff Director, Positive Train Control/Signal Train Control Division, at (202) 493-6399 or c.hayward-williams@dot.gov or Dr. Mark Hartong, Senior Scientific Technical Advisor, at (202) 493-1332 or mark.hartong@dot.gov.

Sincerely,

A handwritten signature in dark ink, appearing to read "Thomas J. Herrmann", followed by a long horizontal line extending to the right.

Thomas J. Herrmann
Director, Office of Technical Oversight

⁴ 49 U.S.C. § 20157(a)(3)(A)–(D).



October 6, 2017

Mr. Robert C. Lauby, P.E.,
Associate Administrator for Railroad Safety & Chief Safety Officer
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC, 20590

Re: Long Island Rail Road Test Waiver Request
East Side Access Harold Interlocking

Dear Mr. Lauby, P.E.,

Attached for your review and approval is a PTC Test Waiver for the ESA Harold Interlocking area.

Long Island Rail Road (LIRR) is in the process of installing the ACSES II system as an overlay to existing signaling systems for its compliance with the Positive Train Control (PTC) regulations of 49 CFR, Part 236, Subpart I. LIRR contracted with a System Integrator (SI) in late 2013 to design, furnish, install, integrate, and commission ACSES II throughout the railroad's mainline trackage.

In addition to the system-wide PTC deployment, LIRR has undertaken the East Side Access (ESA) project as a major system expansion, constructing a new connection between Grand Central Terminal (GCT) in midtown Manhattan and LIRR's major interlocking complex in Queens, NY known as "Harold Interlocking". Harold is a very large interlocking complex with many hundreds of trains operating through it everyday including both LIRR trains and Amtrak trains. The interlocking is undergoing major track and signal system changes via a multitude of reconfigurations in order to create the connection to GCT. The reconfiguration is being accomplished while maintaining LIRR's high density train movements through the area.

The Harold Interlocking reconfiguration under traffic is very challenging, requiring major shifts in the physical infrastructure and new interlocking signaling. Many stages are required to implement the reconfiguration. The current ESA project schedule will not achieve a stable configuration for the existing train movements through the interlocking until the end of October 2017. Due to the staging complexity and late 2018 scheduled completion for existing routes through the interlocking complex, the LIRR is requesting a waiver from the PTC regulation requirements to be commissioned by December 31, 2018.

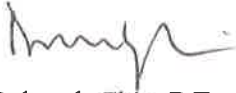
The multi-staging of the Harold reconfiguration represents a significant challenge and inherent risk associated with changing, testing, commissioning the safety-critical topographic databases and transponder placements of ACSES II at Harold. The proposed waiver is to exclude the installation of ACSES II transponders and associated database implementations and testing until the new routes supporting existing train movements through Harold are completed. Upon completion of the stage in which existing service operates, LIRR proposes to install, test, and enter in to Revenue Service Demonstration (RSD) ACSES II capabilities on the active Harold routes as soon as possible. The

remaining routes at Harold that have not been completed at that time would be commissioned fully compliant with PTC regulations as they are completed and readied for service.

Throughout the Harold staging, today and to completion, LIRR's 49 CFR Part 236, Subpart A through H compliant cab signaling with continuous Automatic Train Control would govern train movements on all main line routes. Details of the proposed Harold PTC implementation are outlined in the attached.

Should you have any questions, please contact me at 718-558-3538.

Sincerely,



Deborah Chin, P.E.
Executive Director - PTC
MTA Long Island Rail Road

CC: A. Arenth, LIRR
L. Warren, FRA

A. Hezarkhani, LIRR


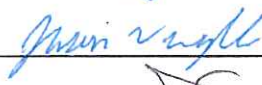
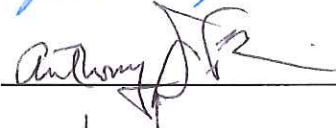
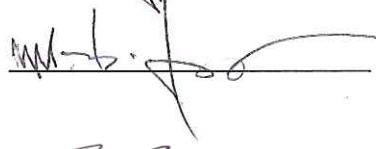

H. Forshner, MTA CC

Attachment: 1314 Harold Interlocking Test Waiver Request - LIRR - 3051476 Rev___.pdf

Metropolitan Transportation Authority
Long Island Rail Road
PTC – SYSTEM INTEGRATION
Bombardier Siemens PTC Project Consortium
Contract Numbers: 1712

LIRR Harold Interlocking Test Waiver Request

Responsible Division:	Responsible Unit:	Document Type:	Distribution Status:	Document State:
BT-SRA	PM	Report	Project	Released

Prepared:	Daniel Laguna System Integrator		2017-09-20
Verified:	Jason Weighley System Safety Coordinator		2017-09-20
Approved:	Anthony DeFrancisco Project Director		9-22-17
SI Quality Process Review:	Bon Provenzano BT Quality Assurance Group		2017-09-22
BT/SRA Review:	Rick Galloway System Integrator		2017-09-25
BT/SRA Review:	NA Title		

Name / Title, Group	Signature	Date
<div style="display: flex;"> <div style="flex: 1;"> <p>Nothing herein shall limit the rights of the Railroads under Article 404 of Contract Nos. 1712/29544.</p> <p>© 2017, Bombardier Inc. or its subsidiaries.</p> <p>Copyright © 2017 Siemens Industry, Inc.</p> </div> <div style="flex: 1; border-left: 1px solid black; padding-left: 10px;"> <p>Reference Document #:</p> <hr/> <p>Identity Number:</p> <p style="font-size: 1.2em; text-align: center;">3051476</p> <div style="display: flex; justify-content: space-between;"> <div> <p>Effective Date:</p> <p style="text-align: center;">2017-09-20</p> </div> <div> <p>Revision:</p> <p style="text-align: center;">___</p> </div> <div> <p>Language:</p> <p style="text-align: center;">EN</p> </div> </div> </div> </div>		

Revision Log

Revision	Date (yyyy-mm-dd)	Description of Changes
____	2017-09-20	Initial version

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1 Executive Summary

Long Island Rail Road's (LIRR) currently terminates and originates service in midtown Manhattan, New York only at Penn Station. LIRR's East Side Access (ESA) project provides a new branch line to Grand Central Terminal (GCT) in Manhattan via the 63rd Street Tunnel. The new line to GCT merges with LIRR's Main Line in Queens, NY at LIRR's "Harold" interlocking. As part of ESA, "Harold" is being significantly reconfigured and re-signaled. The "Harold" reconfiguration includes many stages. The "Harold" reconfiguration is scheduled to be substantially completed by the end of 2018.

Concurrently with the ESA project work, LIRR is deploying ACSES system throughout its territory to provide the additional functionality to its existing signaling required to comply with Part 239, Subpart I. Supporting multiple track and signal reconfigurations and staging at "Harold" with new ACSES transponders and Office system database changes would be extremely challenging. Accordingly, LIRR is requesting a waiver that permits its ACSES system to not be implemented for "Harold" routes until the ESA staging is physically complete.

This waiver request, if granted by FRA will allow MTA to complete the necessary Harold Reconfiguration works with the ESA Project, and the testing of the ACSES II PTC system. The final PTCSP would incorporate this waiver. An update to the PTCSP will be submitted to FRA once the planned works and tests have been completed and the Harold/ESA is ready for commissioning.

2 Introduction

Pursuant to 49 Code of Federal Regulations (CFR) §236.1035, the Long Island Railroad (LIRR) submits the following Waiver request to support the planned Civil Works and Signaling works on the MTA ESA Project.

The Harold Interlocking territory is undergoing a complete redesign of the track layout and the Signaling system controlling this area. These works comprise the addition and removal of switches, signals and track circuits as well as the addition, removal and reconfiguration of tracks.

The works are divided into multiple stages. A total of 4 main stages, each with sub-stages are planned from the issuance of this waiver request till the completion of the works planned for April 2023.

The number of stages required for completing the works plus the necessary reconfigurations expected for each of them makes extremely complicated the Installation, Testing and Commissioning of the ACSES II PTC system. Due to the track reconfiguration, the Transponder design and layout would need to be changed for every stage increasing the Safety related risks associated with continuous modifications of the vital system. Likewise, the WIU units will require numerous reprogramming to match the new or modified tracks, switches and signals. It will also require the functional operation testing of the Amtrak ACSES II PTC System and the LIRR ACSES II PTC System entering and exiting Harold Interlocking.

To eliminate the possible hazards derived from the staged implementation of the ESA Project Harold reconfiguration, LIRR is requesting a waiver to exclude the Harold Interlocking territory from the PTCIP and PTCSP until the planned works are completed in this territory.

This document describes the installation, testing and commissioning strategy as well as the high-level schedule planned to ensure the proper introduction of the ACSES II PTC system in the Harold Interlocking territory.

2.1 Reference Documents

Table 1: Reference Documents

Reference Number	Document Name	Identification Number	Revision
[1]	Dictionary of Terms and Acronyms	3035624	_A
[2]	LIRR PTCIP	NA	3.0 (Jan 26, 2016)
[3]	LIRR PTCDP	NA	5.3
[4]	49 CFR §236 – All Subparts A – I	NA	NA
[5]	49 CFR §216, §217, §229, and §240	NA	NA
[6]	System Description Document (CDRL 2-027)	3035724	_G
[7]	LIRR System Architecture Description	3038633	_A
[8]	LIRR FRA Test Waiver Request	3045791	_C
[9]	Signed conditional approval LIRR test waiver request	RRS-1820005	N/A
[10]	LIRR Pilot Program Plan (CDRL 2-019)	3035622	_B

3 High level Schedule

The following diagram shows the high-level timeline planned for the reconfiguration of the Harold interlockings. This schedule is limited to the Civil Works and non-PTC signaling works.

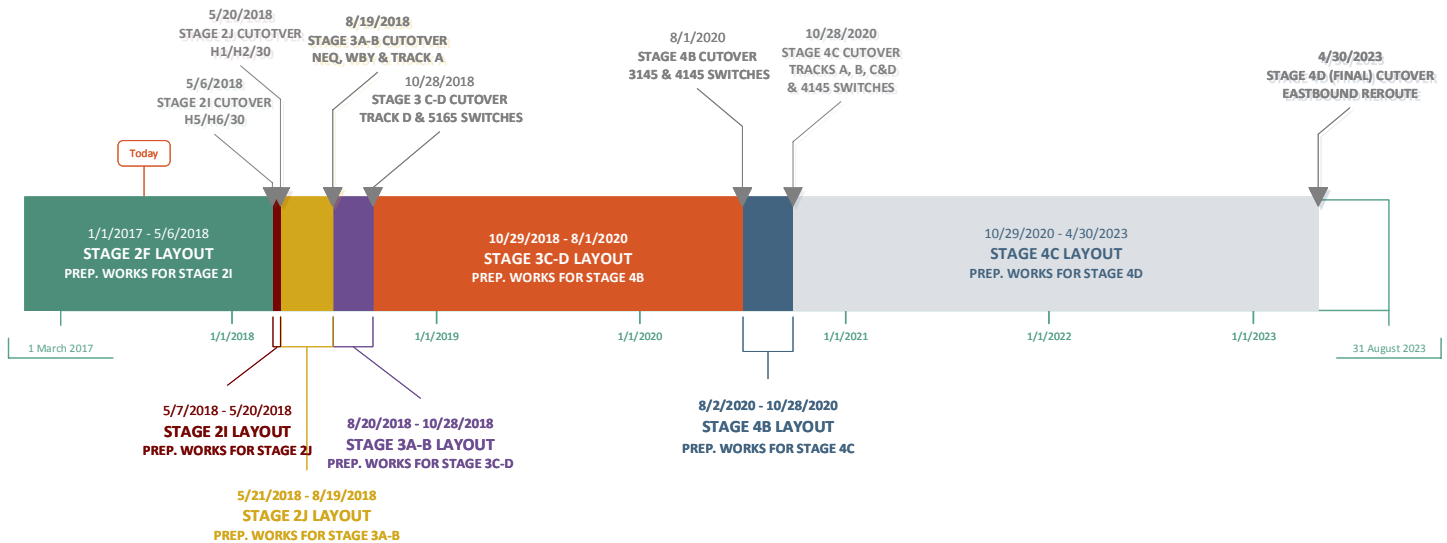


Figure 1 Harold Staging High Level Timeline

As shown in the planned timeline, the main cutover target dates are:

- Stage 2F: Current layout.
- Stage 2I Cutover: May 2018
- Stage 2J Cutover: May 2018
- Stage 3A&B Cutover: August 2018
- Stage 3C&D Cutover: October 2018
- Stage 4B Cutover: August 2020
- Stage 4C Cutover: October 2020
- Stage 4D Cutover: April 2023

The major changes in terms of track layout happen between stages 2F and 2J as well as between stages 2J and 3C&D, for this reason, the ACSES II PTC system will not be installed until a stable track layout is cutover in order to avoid Transponders, WIU and potentially Radio reinstallation and configurations leading to potential Safety hazards. Based on current layout and staging design this point will be after the stages 3C&D.

As part of this waiver, LIRR is requesting to delay the introduction of the ACSES II PTC system until the Harold layout is stable or with minimal changes affecting the PTC functionality. The proposed high level timeline for the commissioning of the ACSES II PTC system in this area is shown in the diagram below.

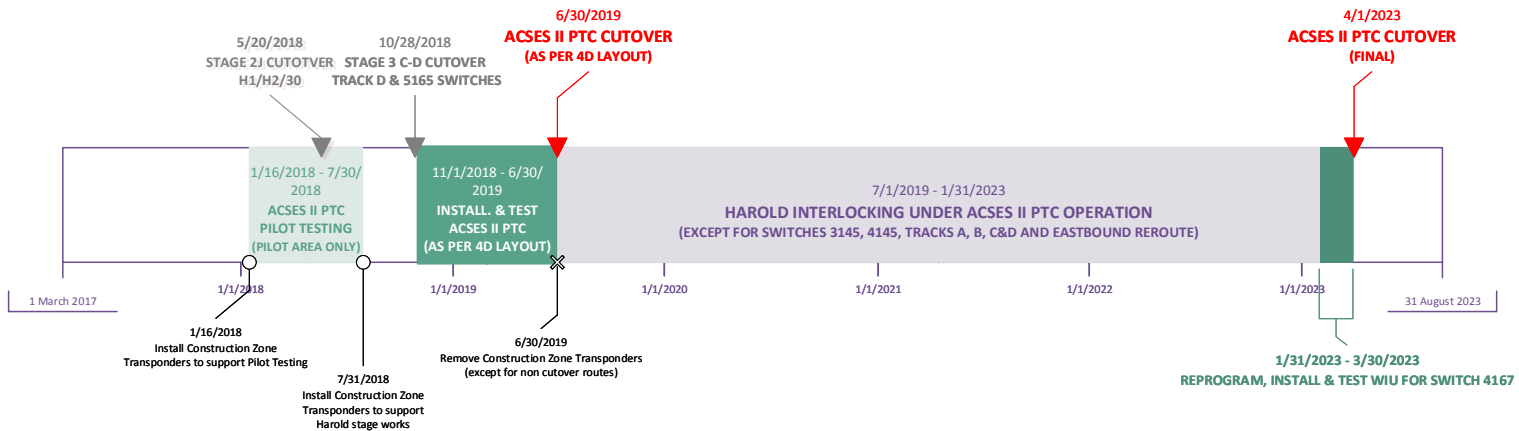


Figure 2 Harold ACSES II PTC Cutover High Level Timeline

The main target milestones for the installation and cutover of the ACSES II PTC system are:

- Installation of Construction Zone Transponders to enable Pilot Testing: 1/16/2018
- Installation of Construction Zone Transponders to support the remaining Harold Stage works: 7/31/2018
- Commence the installation of the Transponders, WIU and Radio sites as per final layout: 11/1/2018
- Initial cutover of ACSES II PTC on Harold: 6/30/2019
- Final cutover ACSES II PTC on Harold (updates to match final layout (4D)): 4/1/2023

Under this concept, if approved by FRA, and in the absence of unforeseen ESA schedule delays, all of today's train movements on LIRR's Main Line through "Harold" including Amtrak routes to and from the Hell Gate Line would be fully PTC compliant by the summer of 2019. The ESA routes to and from ESA GCT will be fully PTC compliant when the routes open for revenue service. In essence then the waiver is a 6-month delay in the implement of full PTC compliance. It is noted that throughout the Harold staging, LIRR's cab signal and Automatic Train Control (ATC) system will provide for PTC protections except as can occur from Stop Signal violations and temporary speed restrictions.

4 Description of changes per stage

4 major stages with a total of 16 sub-stages are planned to complete the Harold interlocking reconfiguration. At the time of creation of the initial version of this document Stage 2F is cutover. In this document details for the remaining stages are provided.

4.1 Stage 2I

The Stage 2I cutover is focused on the H5, H6 and Location 30 CILs.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.1.1 Track Changes.

On stage 2I the New Main Line (ML) 4 track will be configured as per its permanent alignment. No tracks are removed on this stage.

4.1.2 Switch changes.

The following switches will be cut in:

- 4178 E/W
- 6156 E/W
- 6167 E/W
- 6176 E/W
- 6776 MPF

The following switches will be removed:

- 5167 E/W (863)
- 5178 (865)
- 4276 E/W (843)

4.1.3 Signal changes.

As part of this stage, the following signals are added:

- 55E
- 56E
- 57E
- 16-4
- 55W
- 56W
- 57W
- 21-4
- 65E
- 66E
- 67E
- 68E
- 68W
- 22-4
- 24-2
- 24-4
- 67W
- N24
- 66W
- NY44-2
- 65W
- N30
- 30-2
- 30-4
- 31-2.

The following signals are removed during this stage:

- 856E
- 858E
- 860W
- 856W
- 858W
- 858WC
- 862EA
- 18
- N18
- NY2.48
- N30
- 30-2
- 30-4
- 31-2.

4.2 Stage 2J

The Stage 2J cutover affects the H1, H2 and Location 30 CILs

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.2.1 Track Changes.

No tracks are added or removed during this stage.

4.2.2 Switch changes.

The following switches will be cut in:

- 3234 E/W

The following switches will be removed:

- 803 E/W
- 805 E/W

The following switch will be renamed during this stage:

- 801 renamed to 1121.

4.2.3 Signal changes.

As part of this stage, the following signals are added:

- 25W
- 22W
- 23W
- 24W
- 24WC
- 12E
- 13E

- 14E
- 13W
- 14W
- 11W
- 12W
- PW1E
- NY44-1
- N31
- 31-1
- 31-3
- 30-1.

The following signals are removed during this stage:

- 808W
- 810W
- 812WA
- 812WC
- 800E
- 806E
- 804E
- 802W
- 804W
- 872E
- 22N
- N31
- 31-1
- 31-3
- 30-1.

4.3 Stages 3 A&B

On Stages 3 A&B the NEQ, the WBY and Track A are cutover.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.3.1 Track Changes.

Track WBY is introduced as part of this stage. No tracks are removed.

4.3.2 Switch changes.

The following switches will be cut in:

- 1121 E/W Route over 1121E normal is disabled until WBY is completed.
- 1112 E/W
- 1134 E/W
- 1123 E/W Blocked N until WBY is completed.
- 835 Blocked N until WBY is completed.

- 3132 E/W
- 3121 E/W Circuitry cutover/pinned N. Sw's installed in 2019 & blocked N until WBY is completed.
- 3111E Circuitry cutover/pinned N. Sw installed in 2019 & blocked N until WBY is completed.
- 2122 Blocked N until Track A is in service completed.

The following switch will be removed:

- 1121 Turnout (formally 801) relocated as 1121 E/W.

4.3.3 Signal changes.

As part of this stage, the following signals are added:

- 832WD Hold applied until WBY is completed
- 31EC Hold applied until WBY is completed
- 31EA Hold applied until WBY is completed
- 31W Hold applied until WBY is completed
- 11E Hold applied until WBY is completed
- 20E Hold applied until Track A is in service

No signals are removed as part of this stage.

4.4 Stages 3 C&D

The works on stages 3 C&D are focused on Track D and the 5165 switches. At the completion of 3D cutover, LIRR plans to commence installation of ACSES transponders and final ACSES data radio locations and cabling.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.4.1 Track Changes.

No tracks are added to service in stages 3C or D. The Engine Track is removed as part of the cutover.

4.4.2 Switch changes.

The following switches will be cut in:

- 6197 E/W Blocked N until Tunnel D is in service
- 6198 Blocked N until Tunnel D is in service
- 6199 Blocked N until Tunnel D is in service
- 5165 E/W WB route disabled over 5165E until 4145/3145 sw's are in service

As part of this cutover the following switches are removed:

- 855 E/W 855W removed and 855E Blocked R until end of Stage 3D for train moves

- 2145 E/W (821) Removed during various stages of 3C/D
- 2254 E/W (811) Removed during various stages of 3C/D
- 2144 Removed during various stages of 3C/D
- 4165 (813) Removed during various stages of 3C/D

4.4.3 Signal changes.

As part of this stage, the following signals are added:

- 2-36 Hold applied until Tunnel D is in service
- 2-39 Hold applied until Tunnel D is in service

One signal is removed as part of this stage:

- 24WC When Engine Track is removed

4.5 Stage 4B

The works on stage 4B introduces switches 3145 and 4145.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.5.1 Track Changes.

No tracks are added or removed during stage 4B.

4.5.2 Switch changes.

The following switches will be cut in:

- 3145 Route between WWD LI Pass & AMT 2 in service
- 4145 Route between WWD LI Pass & AMT 2 in service

No switches are removed on this stage.

4.5.3 Signal changes.

No signals are added or removed during stage 4B

4.6 Stage 4 C

The works on stage 4 C introduces Tracks A, B/C and D as well as switch 1143.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.6.1 Track Changes.

Tracks C&D are introduced as part of this stage. No tracks are removed during this stage.

4.6.2 Switch changes.

The following switches will be cut in:

- 1143 E/W
- 2154
- 2155
- 2154
- 5155

As part of this cutover the following switches are removed:

- 841 Replaced by relocated 4167

4.6.3 Signal changes.

No signals are added or removed during stage 4C.

4.7 Stages 4 D (Final)

Stage 4D is the final planned stage for Harold. This stage is focused on the introduction of the Eastbound Reroute.

On the F interlocking, the 745, 735 E/W, 743 E/W and 741 switches are reconfigured.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.7.1 Track Changes.

The Eastbound Reroute is cut over on this stage. No tracks are removed.

4.7.2 Switch changes.

The following switches will be cut in:

- 4167 E/W
- 2254 Route from EBBR to WWD LI Pass
- 4154

No switches are removed on stage 4D.

4.7.3 Signal changes.

As part of this stage, the following signals are added:

- 12-5
- 45EA
- 45WA

No signals are removed on stage 4D.

5 Proposed ACSES II PTC implementation strategy

As specified in the LIRR PTCIP, the validation of the ACSES II PTC system will be completed on the 2 designated Pilot Lines. The Pilot Line 1 extends from the eastern limits of Babylon Interlocking to the western limits of PD Interlocking. The LIRR Pilot Line L2 extends from the eastern limits of Harold including the routes to and from Amtrak's Hell Gate to Port Washington including Port Wash Yard and Shea yard as well as the Jamaica JCC Office PCC. Testing will utilize the following LIRR locomotive and cab car types: M7, M9, DE30, DM30, SW1001, MP15, and C3 Cab equipped with ACSES II hardware and software and configured to communicate to the LIRR wayside and office. In addition to the LIRR rolling stock, New York and Atlantic Railroad (NYAR) SW1001, MP15, and GP-38 locomotives will be equipped and tested on the LIRR PTC system. Amtrak trains will be operating as a tenant on sections of the Harold interlocking belonging to Pilot L2.

The complete validation of the system requires access to the areas under reconfiguration on the Harold territory.

The original approach for the implementation of the ACSES II PTC on the Harold interlocking was based on a staged approach matching the various Harold construction stages. This way, an installation was planned for Harold Stage 2F then another update for Stage 2J in where the ACSES II PTC system would be cutover and from this point and on a reconfiguration of the Transponders, WIU and Database will be made for each of the intermediate stages (3A/B, 3C/D, 4B, 4C and 4D). For every intermediate stage both database and physical location changes were required. This approach presents significant challenges both from a Configuration Management as well as from a Safety assurance standpoint.

To minimize potential Safety hazards and simplifying the Configuration Management of the ACSES II PTC system and in general the LIRR operations, a strategy based on a (1) single installation and cutover plus a final update is proposed. In this approach, the ACSES II PTC system will be designed for the final layout (Stage 4D) and will be installed and cutover at a stage in where there are minimal changes affecting the Transponders and WIU database after that point in time. In reviewing the layout changes necessary for each of the stages, it is determined that the installation of the Transponders and WIU will be executed after the cutover of stage 3C&D.

To protect trains entering ACSES territory from LIRR on the east, Amtrak on the west, plus Amtrak's Hell Gate line, redundant Construction Zone transponders will be placed. These transponders will also deactivate ACSES onboard enforcement while trains are within Harold. All possible entries will be bounded with Construction Zone Transponders. For testing purposes, trains will enter Construction Zone first and then once in the designated testing area, trains will be cycle power to regain ACSES mode operation. Once testing is finalized trains will leave the territory through Construction Zone Transponders.

The timeline diagram below shows the major milestones and activities for the introduction of the ACSES II PTC system.

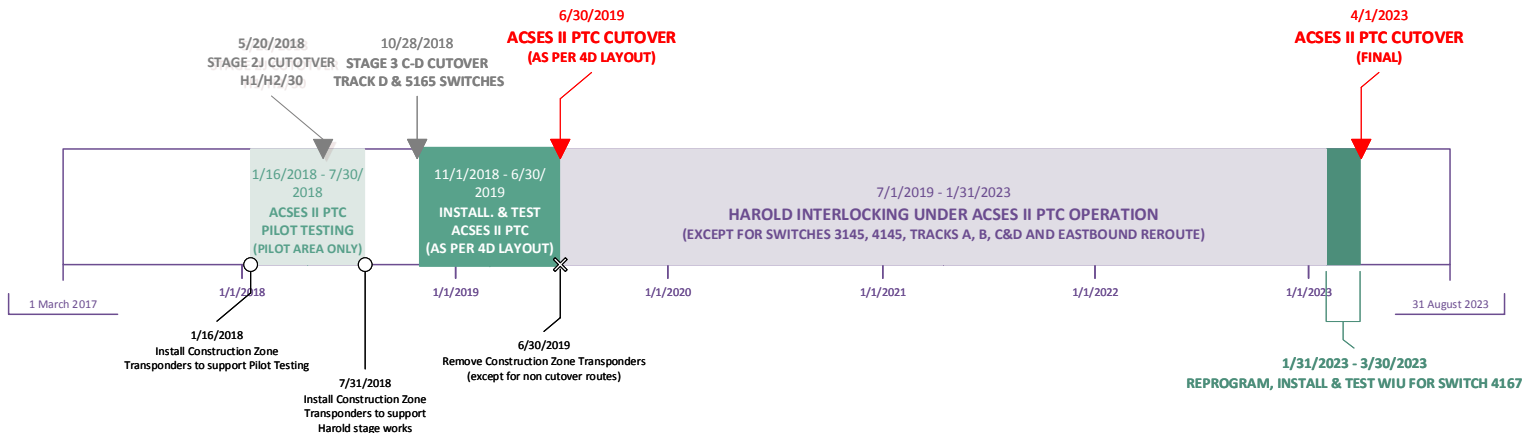


Figure 3 Harold ACSES II PTC Cutover High Level Timeline

The following sections describe the specific Construction Zone transponder layouts and the planned system operation during each of the identified periods.

Attachment B includes the layouts presented in this section.

5.1 Configuration for Pilot Testing

Target dates: 1/16/2018 to 7/30/2018

For Pilot Testing, LIRR will isolate the tracks required for completing the necessary interface test with Amtrak. Tests will be conducted under the Harold 2F layout.

The Pilot Line testing will be conducted on the Port Washington Branch Track 1 eastward of signal 808E (future 22E) including switch 801 for accessing Amtrak track 1 towards Gate interlocking. Switches 803, 807, 815 and 817 will be monitored as part of the Pilot Testing scenarios. The Port Washington Pilot Lines Track 1 testing will be extended till the end of the branch at the Port Washington yard. For Track 2 the limits will be signal N30 at the Woodside Interlocking and the end of track 2 at Neck 2 Interlocking.

The following diagram shows a representation of the Harold interlocking. The tracks highlighted in orange represent the tracks in where ACSES II PTC is possible. Tracks in grey are for tracks under change and as such there is no ACSES operation possible.

Construction zones are denoted by red triangles (Cz) and regular transponders are represented as yellow transponders showing the anticipated number of transponders within the set.

The diagram shows the locations in where WIU will be installed (see green circles) and the anticipated locations for the 220MHz Radio locations.

The following diagrams are not to scale and presents a high -level conceptual design of the ESA/Harold Interlocking used for illustration purposes only. Final drawings will be released once the Transponders and WIU design is completed.

Revision : ____

RR #	436
Line #	087

HAROLD (2F) configuration during Pilot Testing and FRA Certification process

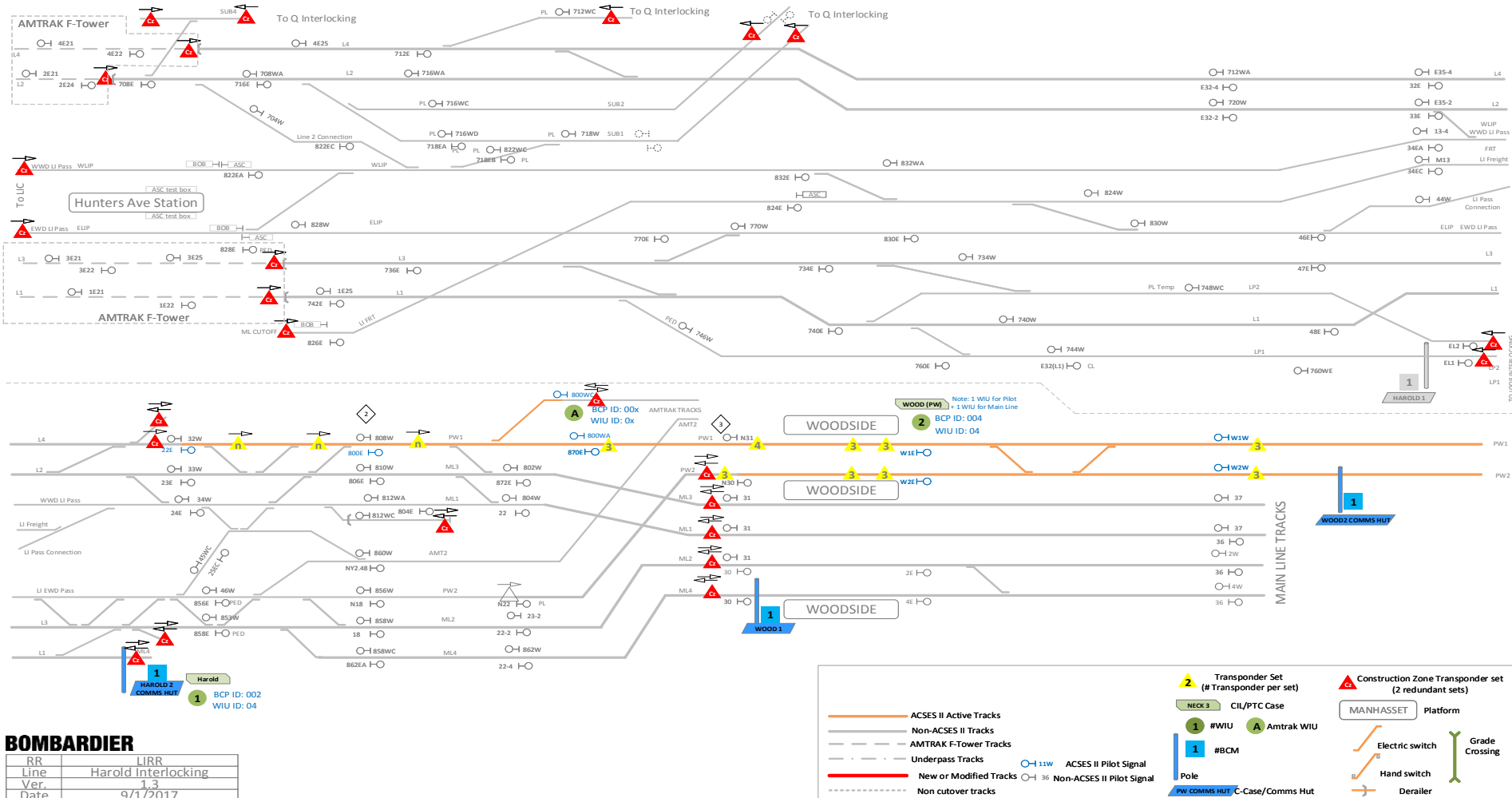


Figure 4 Harold 2F, Configuration during Pilot testing and FRA Certification process

As described, Construction Zone transponders will be installed to prevent trains entering ACSES Mode on the designated Pilot Line areas. Test Trains will be cycle power once the Construction Zone Transponders have been completely cleared, this way the train will enter ACSES mode when reading the next Transponder Set in its route.

For Eastward movements on Port Washington Track 1, transponders will be installed on Construction Zone transponders will be installed East of Signal 22E (after switch 817W) to provide sufficient space for reading the Construction Zone Transponders and the necessary PDS and DS transponders required for signal 800E. For Port Washington Track 1 Westward routes, the construction zone transponders will be installed West of signal 808W. For both Eastwards and Westwards movements on Amtrak Track 1, construction zones will be installed East of signal 800WC. The installation of these Construction Zone transponders will be coordinated with Amtrak.

For Pilot Testing on Port Washington Track 2, Construction Zone transponders will be installed West of Signal N30.

To eliminate the possibility of an equipped train entering ACSES mode on any of the non-Pilot tracks, Construction Zones transponders will be installed at:

- Eastward approaches of Signal bridge 31 on tracks ML3, ML1, ML2 & ML4
- East of Signal 804E
- Spur Tracks West of signal 858E and ML4
- Spur Tracks West of signal 32W and 22E on Port Washington Track 1
- East of Signals EL2 and EL1
- Entrances from Q Interlocking
- East of signal 822EA and 828E
- East of signal 826E
- East of Signal 736E and 742E
- East of Signal 708E and 712E

Attachment B includes the layouts presented in this section.

5.1.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Each Construction Zone transponder set will be tested as prescribed by the Site Installation Test Plan including PICO (Post Installation Check Out) Test and SAT (Site Acceptance Test). Once the installation tests are completed, an equipped train is run over the transponders to ensure proper activation of the Construction Zone mode.

The planned Pilot Testing activities include both Functional and Performance/Integration tests. After the successful completion of the Site Installation Test, the Site Performance Test (SPT) will commence.

The SPT program is designed to verifying and validating the System Functionality. Specific Test Scenarios are developed to verify the proper implementation of the System Level Functions and System Level Requirements. For the Harold section of the Pilot Lines due to its limited extension and significance in terms of Interoperability, the focus of the testing will be:

- Demonstrate ACSES II PTC functions:
 - o ACSES II Modes of operation,
 - o Vitally encoded Transponders data,
 - o PTS,
 - o PTSO,
 - o Data Radio Transmission,
 - o OBC location report,
 - o TSR Enforcement,
 - o Turnback
 - o Stopping accurately at stations close to HS
 - o TSR through junctions
- Demonstrate Railroad Boundary specific and interoperability functionality between LIRR and Amtrak:
 - o Line Boundaries (both at Wayside and Office level)
- All other ACSES II PTC System Level functionalities are tested throughout both Pilot Lines as described on the Pilot Program Plan [10] and LIRR FRA Test Waiver Request [8].

Following the completion of the SPT tests, the Site Integrated System Tests (SIST) will be conducted. The SIST are intended to demonstrate the proper operation and performance of the integrated system. In these test complex, load/capacity and time based scenarios are executed. In the case of Harold, the testing will be focused in the validation of the interface with Amtrak and how different timing and failure mode situations affect the proper interaction of both LIRR's and Amtrak's systems.

As part of the SIST, End to End runs will be conducted with both LIRR and Amtrak trains to ensure proper operation and readiness for Revenue Service Demonstrations.

After completing the SIST and in case necessary the regression testing for closing open Variances, the ACSES II PTC System is ready for Revenue Service Demonstrations.

5.1.2 Operational Restrictions and Training

During this period, only the designated Pilot Trains will be authorized to operate under ACSES mode on the designated Pilot Line tracks. Once the Pilot trains move out of the Pilot area will enforce the Construction Zone limitations. Operation will be as prescribed on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Non-Pilot Trains will operate at all times with ACSES in cut out to prevent enforcing ACSES operation on the equipped tracks. In case trains are operated with ACSES in cut in, trains will not be power cycled within the limits of the Harold interlockings. Should a cycle power be required within the limits of the Harold interlocking the Engineer will set ACSES to cut out.

Appropriate signage will be installing on the entrances to the Construction Zone area to inform the Engineer, likewise, the areas where ACSES operation is allowed will be identified by appropriate signage.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout and Construction Zone areas. Detailed safety briefings will be conducted prior to the execution of any field installation or testing.

Tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

5.2 Configuration after Pilot Lines and prior to ACSES II equipment installation

Target dates: 7/31/2018 to 10/30/2018

Once the Pilot Testing has been completed on the Amtrak RR boundary and the necessary ACSES II functionality has been fully proven in the Pilot Territory, the Port Washington Track 1 section East of signal 800E and West of Signal N31 including switch 801 and signal 800WC will be removed from ACSES II PTC service. This area will be limited with Construction zone transponders. This step is necessary to allow for the expected track layout changes planned for Harold Stage 2J.

In addition to the existing Construction Zone Transponders, a new set of Construction Zone Transponder will be installed East of signal N31 on Port Washington Track 1.

RR #	436
Line #	087

HAROLD (2J) configuration after Pilot Test and FRA Certification to support Harold staging works.

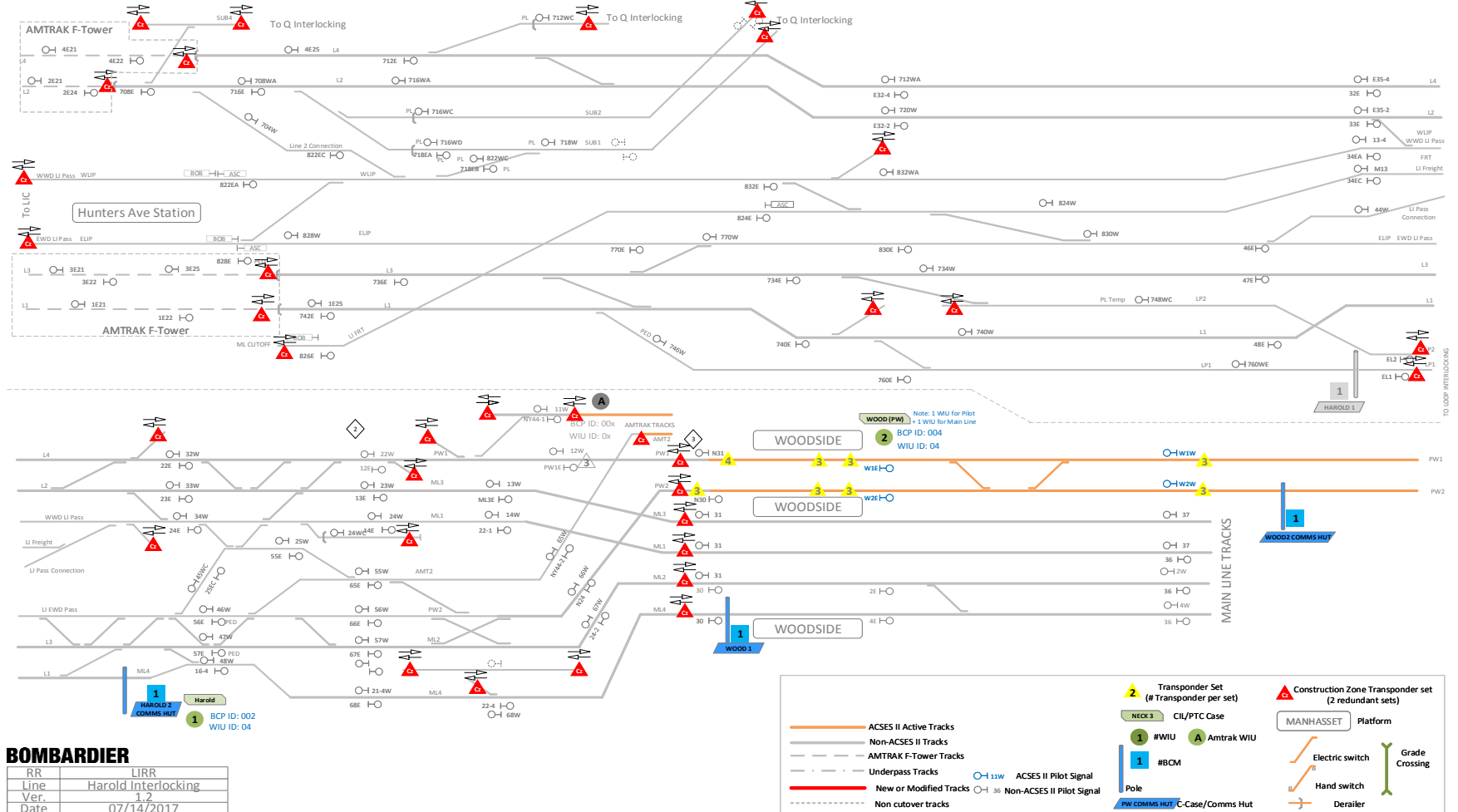


Figure 5 Harold 2J, Configuration after Pilot Test and FRA Certification to support Harold Staging works

5.2.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Each Construction Zone transponder set will be tested as prescribed by the Site Installation Test Plan including PICO Test and Site Installation Test. Once the installation tests are completed, an equipped train is run over the transponders to ensure proper activation of the Construction Zone mode.

No additional System Level Functional, Performance or Integration test are planned for this period.

5.2.2 Operational restrictions and Training

At this point in time, Revenue Service Demonstrations will be run on the Port Washington Branch. To prevent equipped and active trains reading and enforcing transponders outside the designated territory (East of signal W1E and W2E in Woodside), Construction Zone transponders will be installed. Appropriate signage will be installed to inform the Engineers on the entry/exit points.

Operation and testing will be as prescribed on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9]. Non-Pilot Trains operating within the limits of the Harold interlockings will operate at all times with ACSES in cut out to prevent enforcing ACSES operation on the equipped tracks. In case trains are operated with ACSES in cut in, trains will not be power cycled within the limits of the Harold interlockings. Should a cycle power be required within the limits of the Harold interlocking the Engineer will set ACSES to cut out.

As construction works will be ongoing while in this configuration, periodic inspections of the Construction Zone Transponders will be made to ensure proper operation and enforcement.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout and Construction Zone areas.

5.3 Configuration during ACSES II installation

Target dates: 11/1/2018 to 6/30/2019

The installation of the Transponders, WIU and Radio sites for Harold interlocking will be initiated after the cutover of the Harold Stage 3C&D. The remaining layout modifications after this stage are limited to the addition and or modification of switches 3145, 4145, 1143E/W, 2154, 2155 and 5155 as well as the introduction of the Eastbound reroute. Although the changes are significant, they are compatible with the required Transponder Layout for the final stage (4D). ACSES will be implemented with the final configuration. No trains will operate through the incomplete stage areas.

The Harold Transponders design will account for the tracks and switches planned for the final Harold layout (4D) however the WIU inputs for the affected routes will be disconnected to avoid transmitting non-possible routes and distances to the trains as part of the ISR responses.

Construction Zone transponders will be maintained throughout the installation process to avoid any active ACSES train reading the new transponders. New Construction Zone transponders might be required to accommodate any track layout reconfiguration to be worked during the installation of the Transponders and WIUs. All transponders will be installed in place except for the ones belonging to the tracks to be modified during Stages 4B, 4C & 4D. This applies to both the LIRR and Amtrak tracks.

Functional Testing will commence after the installations and Site Installation Test for Transponders, WIU and Radio Sites are completed.

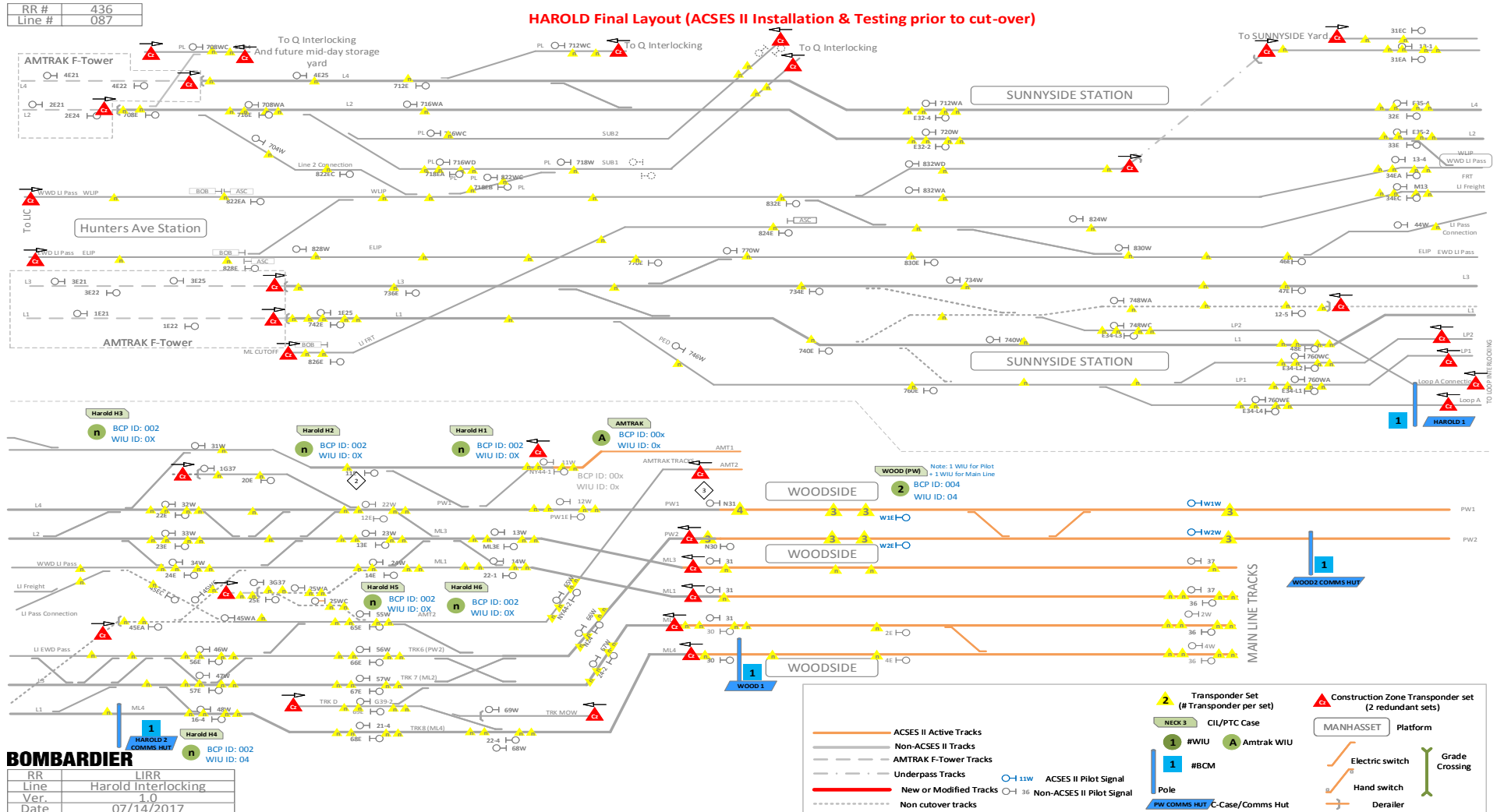


Figure 6 Harold Final Layout (ACSES II Installation & testing prior to cutover.

5.3.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

The ACSES II Transponders, WIU and Radio site equipment installation will be executed as described on the Site Installation Test plan. After the physical installation, PICO test and SAT a subset of the Site Performance Test (SPT) and Site Integrated System Test (SIST) is conducted on the newly installed area. This approach is applicable to all segments after successful completion of the Pilot Testing Program.

The subset of functionality tested corresponds to a 20% of the Test Scenarios developed for the Pilot Lines System Level test and includes all Core ACSES II PTC functions both from a Functional and Performance standpoint.

For Construction Zone transponder sets PICO Test and Site Acceptance Test will be conducted. Once the installation tests are completed, an equipped train is run over the transponders to ensure proper activation of the Construction Zone mode.

In the specific case of Harold, on top of the planned testing subset, additional boundary testing and Amtrak interoperability test will be conducted to ensure proper operation of both LIRR and Amtrak throughout the Harold territory.

After completing the SIST and in case necessary the regression testing for closing open Variances, the ACSES II PTC System is ready for Revenue Service Demonstrations

5.3.2 Operational restrictions and Training

Like previous stages and since new segments and train fleets will be under Revenue Service Demonstration, to prevent equipped and active trains reading and enforcing transponders outside the designated territory (East of signal W1E, W2E, 2E and 4E in Woodside and Signal Bridge 31), Construction Zone transponders will be installed. Appropriate signage will be installed to inform the Engineers on the entry/exit points.

Operation and testing will be as prescribed on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9]. Non-active ACSES Trains operating within the limits of the Harold interlockings will operate at all times with ACSES in cut out to prevent enforcing ACSES operation on the equipped tracks. Should a cycle power be required within the limits of the Harold interlocking the Engineer will set ACSES to cut out to prevent reading of the installed and not verified transponders.

As construction works will be ongoing while in this configuration, periodic inspections of the Construction Zone Transponders will be made to ensure proper operation and enforcement.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout and Construction Zone areas. Detailed safety briefings will be conducted prior to the execution of any field installation or testing.

Tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

5.4 Harold Initial cutover

Target dates: 7/1/2019 to 1/30/2023

Upon successful completion of the Field Integration Tests as prescribed by the Master Test Plan, the Harold interlockings will be ready for its cut over and commence the Revenue Service Demonstrations.

As described in previous sections, the entire interlocking except for the switches 3145, 4145, 1143E/W, 2154, 2155 and 5155 as well as the introduction of the Eastbound reroute will be cut over at once.

To complete the cutover, LIRR will remove all installed Construction Zone transponders bounding the entry and exit of the Harold interlockings. The following Construction Zone Transponders will be maintained to prevent any train operating on the switches and tracks under civil works throughout Stages 4B, 4C and 4D reading the equipment installed in them.

Once the Construction Zone Transponders are lifted, operation under the premises of the Revenue Service Demonstration test will be conducted to ensure proper operation of the system.

Revision : ____

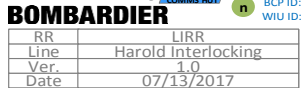


Figure 7 Harold Initial cutover as per Harold Stage 4D layout

5.4.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Prior to the cutover of the ACSES II PTC system and after having completed the Field Test program (see section 4.3.1), End to End runs of both LIRR and Amtrak trains (on applicable routes) will be conducted to ensure the System operation is stable and ready for cutover.

5.4.2 Operational restrictions and Training

Appropriate signage will be installed to inform the Engineers of the areas under ACSES II PTC system operation and the ones still to be activated.

As construction works will be ongoing while in this configuration, periodic inspections of the Construction Zone Transponders will be made to ensure proper operation and enforcement.

Coordination with Amtrak will be required to ensure proper interoperability throughout the Harold Interlockings.

No other operational restrictions will be required once the ACSES II PTC system Revenue Service Demonstration period is completed.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout Modes of Operation and Construction Zone areas. Train Engineers must be trained on the Operation of the ACSES II PTC System prior to operating a train on the cutover section.

All tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

5.5 Harold Final cutover

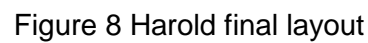
Target dates: 1/31/2023 to 3/30/2023

The final step to complete the cutover of the Harold interlocking as per its final layout is to install and test the switches 3145, 4145, 1143E/W, 2154, 2155 and 5155 as well as the Eastbound reroute introduced during Stages 4B, 4C and 4D.

Approximately 2 months before the planned Harold Stage 4D cutover, a reprogramming of the WIUs and Transponders serving the switches 3145, 4145, 1143E/W, 2154, 2155, 5155 and the Eastbound reroute will be completed. On top of the Transponders and WIU updates, it is anticipated an update to the Office Database. Construction Zone Transponders will be maintained during the reprogramming and testing activities.

Once the prescribed testing program is completed and making it coincident with the planned Harold Stage 4D cutover, the remaining Construction Zone transponders will be dismantled completing this way the cutover of the ACSES II PTC system.

Revision : ____



5.5.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Prior to the cutover of the ACSES II PTC system and after having completed the Field Test program (see section 4.3.1), End to End runs of both LIRR and Amtrak trains (on applicable routes) will be conducted to ensure the System operation is stable and ready for cutover.

For this stage updates to the Transponders Telegrams and WIU configurations are required, once updated, Site Acceptance Test (SAT) will be run for the affected equipment to ensure proper operation and readiness to support both the Site Performance test (SPT), Site Integrated System Test (SIST) and final End to End runs.

The subset of functionality tested corresponds to a 20% of the Test Scenarios developed for the Pilot Lines System Level test and includes all Core ACSES II PTC functions both from a Functional and Performance standpoint.

At this point, all Construction Zone transponders are removed as such no specific testing is required. The End to End runs conducted as part of the SIST will verify that proper Mode of Operation is maintained throughout the Harold interlockings.

For the final cutover, there is no need of testing the RR boundaries as this is not affected by the layout changes introduced as part of the Harold Stages 4B, 4C and 4D.

After completing the SIST and in case necessary the regression testing for closing open Variances, the ACSES II PTC System is ready for Revenue Service Demonstrations

5.5.2 Operational restrictions and Training

All temporary signage will be removed once the cutover is completed.

Coordination with Amtrak will be required to ensure proper interoperability throughout the Harold Interlockings.

No other operational restrictions will be required once the ACSES II PTC system Revenue Service Demonstration period is completed.

Tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

6 Operational Considerations

The LIRR PTC Implementation Plan (PTCIP) Rev 3.0 developed in fulfillment of 49 CFR Part 236, Subpart I, 236.1011 along with the LIRR Operating Concepts provides a description of the applicable Operational Considerations including a list with complete descriptions of all functions which the PTC system will perform to enhance or preserve safety as required by §236.1013(a)(3). The concept of operations is organized generally in accordance with Institute of Electrical and Electronics Engineers (IEEE) standard 1362-1998. It describes ACSES II functionality, operation and characteristics generally from the user's perspective. A limited description of the internal workings of the system is included in some sections where it augments understanding of observable system behavior.

7 Description of Measures of Protection and Test Procedures– §236.1035(a)(3)

As always, safety and protection of the public comes first and is of the utmost importance during these Field Testing proceedings. In order to protect the test train crew, and all involved with the testing, LIRR will use the following measures of protection:

- A job briefing will be conducted with each affected employee, contractor and/or observer prior to each Field Test to ensure that every individual clearly understands the test to be conducted and the movements to be made in support of that test.
- To facilitate testing of predictive or reactive enforcement of Temporary Speed Restrictions (TSR), the Test Manager may construct and convey speed restrictions to the ACSES II PTC system for test purposes through the use of simulation tool(s).
- To facilitate testing of Work Zone requirements, the Test Manager may construct and convey Work Zone Bulletin Line items to the ACSES II PTC system for test purposes through the use of simulation tool(s).
- To facilitate testing of Movement Authorities, the Test Manager may construct and convey Stop Release Push Button, Authority to Pass Signal Displaying STOP Indication, or Track Authority to the ACSES II PTC system for test purposes through the use of simulation tool(s).
- To facilitate predictive and reactive enforcement of signal indications, operating procedures will be in place to permit the test train to safely pass a signal displaying an indication being tested, or the indication may be simulated at a signal actually displaying a more permissive aspect.
- If required, an absolute block will be utilized for tests that require the testing of moving equipment. This requirement will be evaluated on a test by test basis.
- All tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

8 Testing's Effect on Current Method of Operation –§236.1035(a)(7)

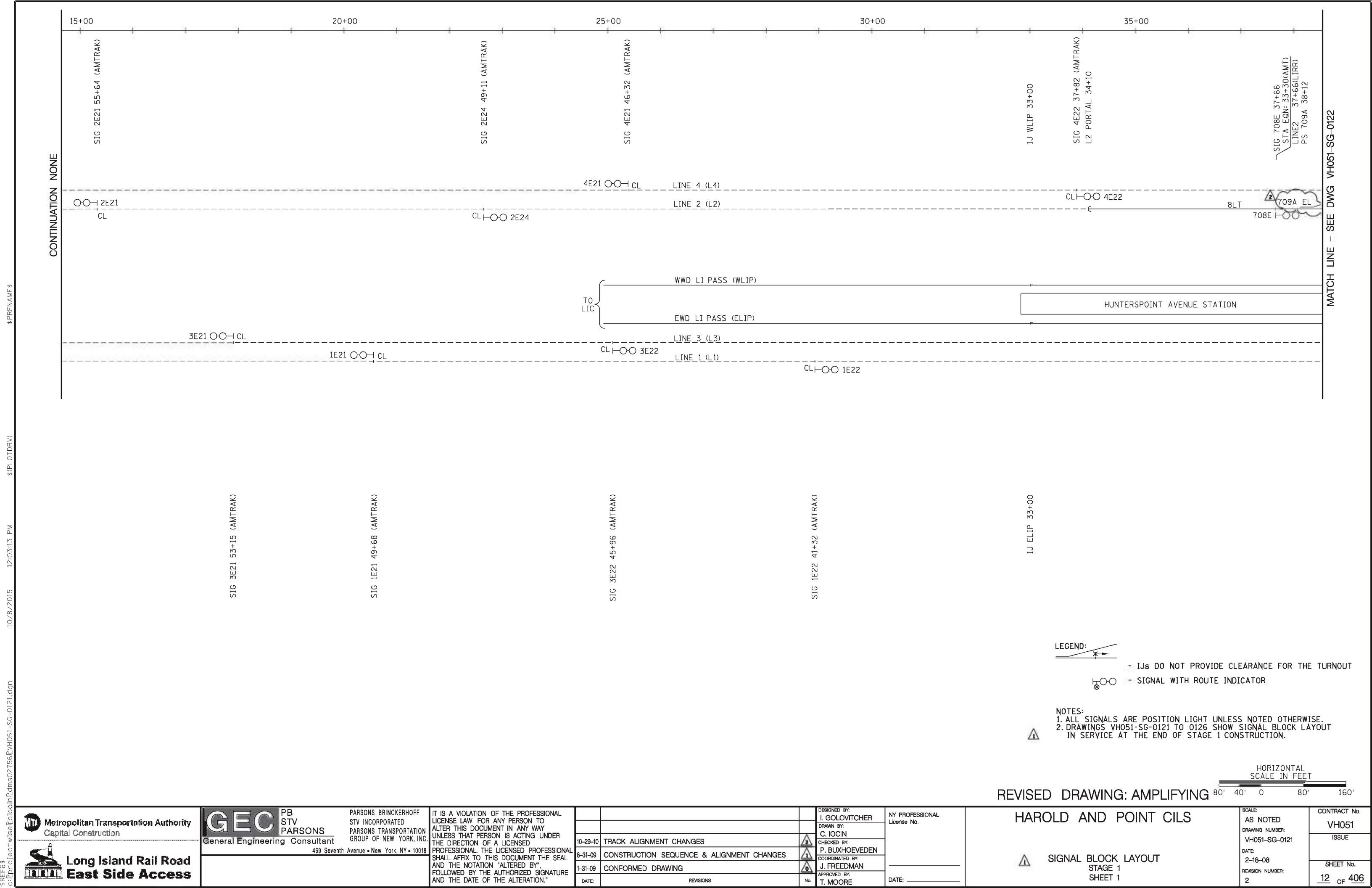
ACSES II PTC testing will have no effect on the current Method of Operation on the Harold interlocking while the PTC system is under installation or test.

9 Final Recommendation

The waiver request that the new LIRR ACSES II PTC System be cutover following the ESA completion of stages 3C and 3D. This should be completed by late October 2018, with testing and commissioning completed by June 2019. Due to facts that the PTC project is driven by the ESA Project Schedule, any delay in the ESA Schedule could result in a delay in the PTC completion date. The PTC project will make every effort to meet the June 30, 2019 date and will keep FRA updated as these dates get closer.

Attachment A

(Signal Block Layouts 10-10-15rev1)



LEGEND:

NOTES:
1. ALL SIGNALS ARE POSITION LIGHT UNLESS NOTED OTHERWISE.
2. DRAWINGS VH051-SG-0121 TO 0126 SHOW SIGNAL BLOCK LAYOUT IN SERVICE AT THE END OF STAGE 1 CONSTRUCTION.



REVISED DRAWING: AMPLIFYING

Metropolitan Transportation Authority
Capital Construction

Long Island Rail Road
East Side Access

GEC
General Engineering Consultant

PB
STV
PARSONS

PARSONS BRINCKERHOFF
STV INCORPORATED
PARSONS TRANSPORTATION
GROUP OF NEW YORK, INC.
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DATE	REVISIONS	No.
10-29-10	TRACK ALIGNMENT CHANGES	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
1-31-09	CONFORMED DRAWING	0

DESIGNED BY:
I. GOLOVITCHER

DRAWN BY:
C. IOCIN

CHECKED BY:
P. BUXHOEVEDEN

COORDINATED BY:
J. FREEDMAN

APPROVED BY:
T. MOORE

NY PROFESSIONAL License No.

DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 1
SHEET 1

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0121
DATE:
2-18-08
REVISION NUMBER:
2

CONTRACT No.
VH051
ISSUE
SHEET No.
12 OF 406



 SIGNAL BLOCK LAYOUT
STAGE 1
SHEET 3


SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0123	ISSUE
DATE: 2-18-08	SHEET No. 14 OF 406
REVISION NUMBER: 1	



Metropolitan Transportation Authority
Capital Construction



Long Island Rail Road
East Side Access

	PB STV PARSONS	PARSONS BRINCKERHOFF STV INCORPORATED PARSONS TRANSPORTATION GROUP OF NEW YORK, INC.
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AND THE DATE OF THE ALTERATION."


8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	
1-31-09	CONFORMED DRAWING	
DATE:	REVISIONS	













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DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	

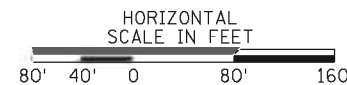
HAROLD AND POINT CILS

△ SIGNAL BLOCK LAYOUT
STAGE 1
SHEET 3



 SIGNAL BLOCK LAYOUT
STAGE 1
SHEET 4






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					6-14-13 ML4 ROUTE REVISED  1	10-29-10 TRACK ALIGNMENT CHANGES  2	8-31-09 CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES  3	1-31-09 CONFORMED DRAWING  4	DATE: _____ REVISIONS No. _____	DESIGNED BY: I. GOLOVITCHER DRAWN BY: C. IOGIN CHECKED BY: P. BUXHOEVEDEN COORDINATED BY: J. FREEDMAN APPROVED BY: T. MOORE	NY PROFESSIONAL License No. _____ DATE: _____		SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0124 DATE: 2-18-08 REVISION NUMBER: 3	CONTRACT No. VH051 ISSUE SHEET No. 15 OF 40

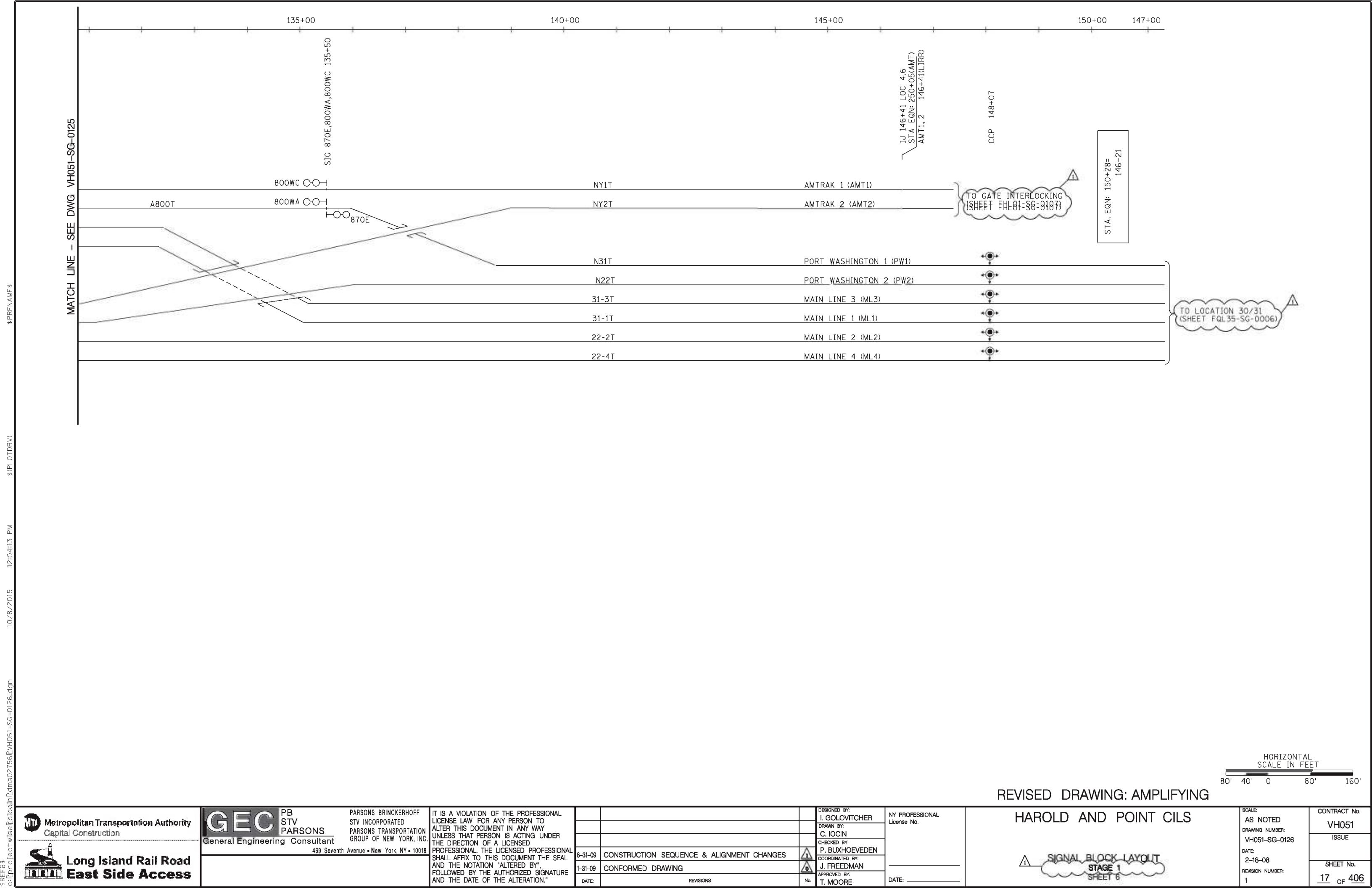


SIGNAL BLOCK LAYOUT
STAGE 1
SHEET 5

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0125	ISSUE
DATE: 2-18-08	SHEET No. 16 OF 40
REVISION NUMBER: 3	

6-14-13	ML4 ROUTE REVISED
10-29-10	TRACK ALIGNMENT CHANGES
6-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES
1-31-09	CONFORMED DRAWING
DATE:	REVISIONS

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	CHECKED BY: P. BUXHOEVEDEN	
	COORDINATED BY: J. FREEDMAN	
	APPROVED BY: T. MOORE	



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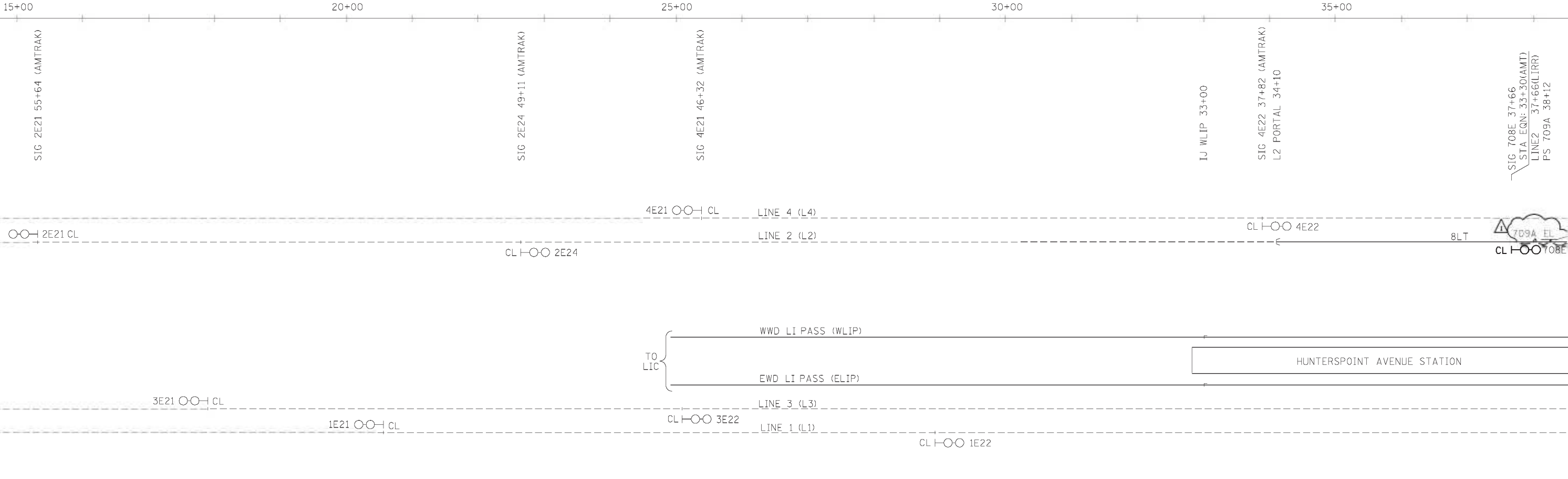
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10/8/2015

\$REF63
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CONTINUATION NONE



NOTES:
1. DRAWINGS VH051-SG-0501 TO 0506 SHOW LAYOUT IN SERVICE AFTER "F2" ("F" SOUTH) CIH CUTOVER (STAGE 2A) AND "F1" ("F" NORTH) CIH CUTOVER (STAGE 2B). EXISTING POINT CIL, HAROLD CIL AND LOOP CIH ARE IN SERVICE.
2. ALL SIGNALS ARE POSITION LIGHT UNLESS NOTED OTHERWISE.

- LEGEND:
- IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT
 - SIGNAL WITH ROUTE INDICATOR
 - EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT
 - NEW LAYOUT PLACED IN SERVICE DURING THESE STAGES



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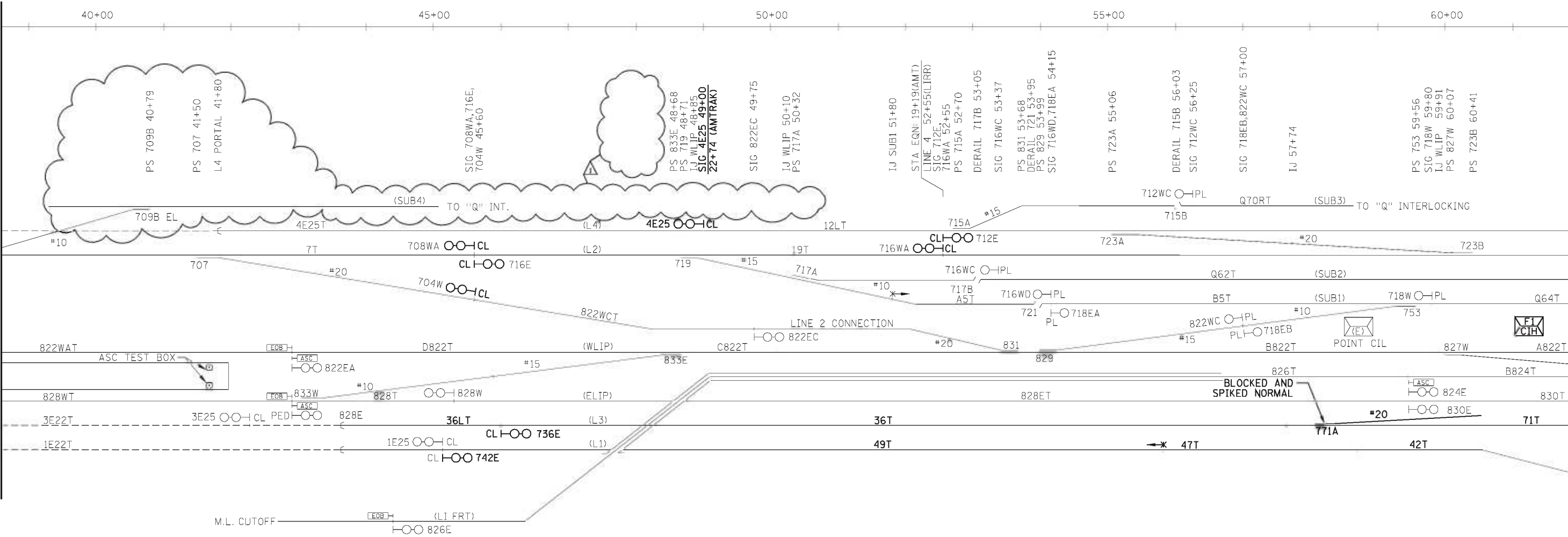
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10/8/2015

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MATCH LINE - SEE DWG VH051-SG-0501

MATCH LINE - SEE DWG VH051-SG-0503



STA. EQN: 28+78(AMT)
LINE3 42+27(LIRR)
SIG 3E25 42+27

SIG 822EA, 828E 42+90
PS 833W 43+08

L3, L1 PORTAL 43+62

SIG 826E 44+40

STA. EQN: 25+11(AMT)
LINE1 45+13(LIRR)
SIG 1E25, 742E 45+13
SIG 828W 45+30

SIG 736E 46+00

IJ 45+88

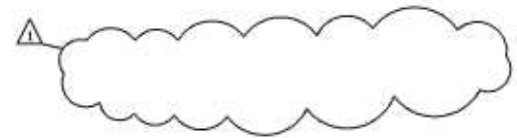
IJ L1, IJ 55+82

IJ L3 57+65

PS 771A 58+07

IJ L1 58+70

SIG 824E, 830E 59+32



REVISED DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGES 2A, 2B
SHEET 2

Metropolitan Transportation Authority
Capital Construction

Long Island Rail Road
East Side Access

GEC

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AND THE DATE OF THE ALTERATION."

10-29-10	TRACK ALIGNMENT CHANGES	
DATE:	REVISIONS	No.

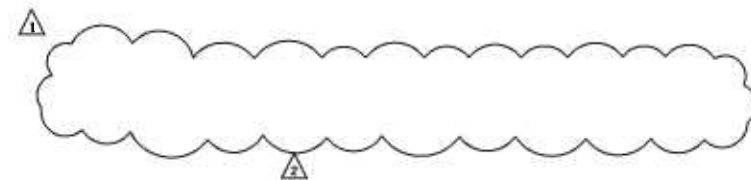
DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOGIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
T. MOORE

NY PROFESSIONAL
License No.

DATE:

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0502
DATE:
8-31-09
REVISION NUMBER:
1

CONTRACT No.
VH051
ISSUE
SHEET No.
18B OF 406





REVISÉ DRAWING: AMPLIFYING

SIGNAL BLOCK LAYOUT
STAGES 2A, 2B
SHEET 5

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0505	ISSUE
DATE: 8-31-09	SHEET No.
REVISION NUMBER: 2	<u>18E</u> OF 40

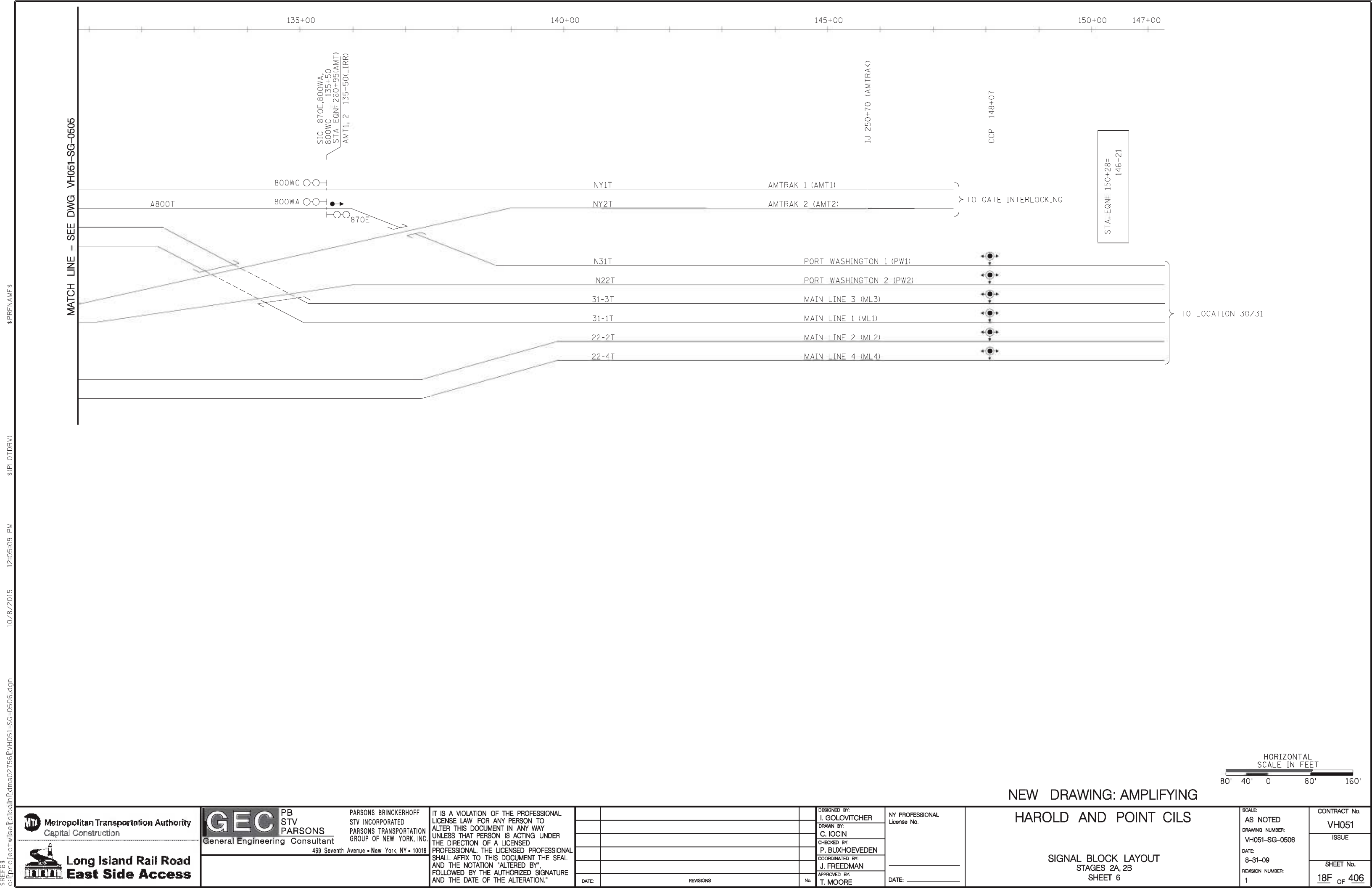
6-14-13	ML4 ROUTE REVISED
10-29-10	TRACK ALIGNMENT CHANGES
DATE:	REVISIONS

	DESIGNED BY: I. GOLOVITCHER
	DRAWN BY: C. IOGIN
	CHECKED BY: P. BUXHOEVEDER
	COORDINATED BY: J. FREEDMAN
No.	APPROVED BY: T. MOORE

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License No. _____

DATE: _____

MATCH LINE - SEE DWG VH051-SG-0506



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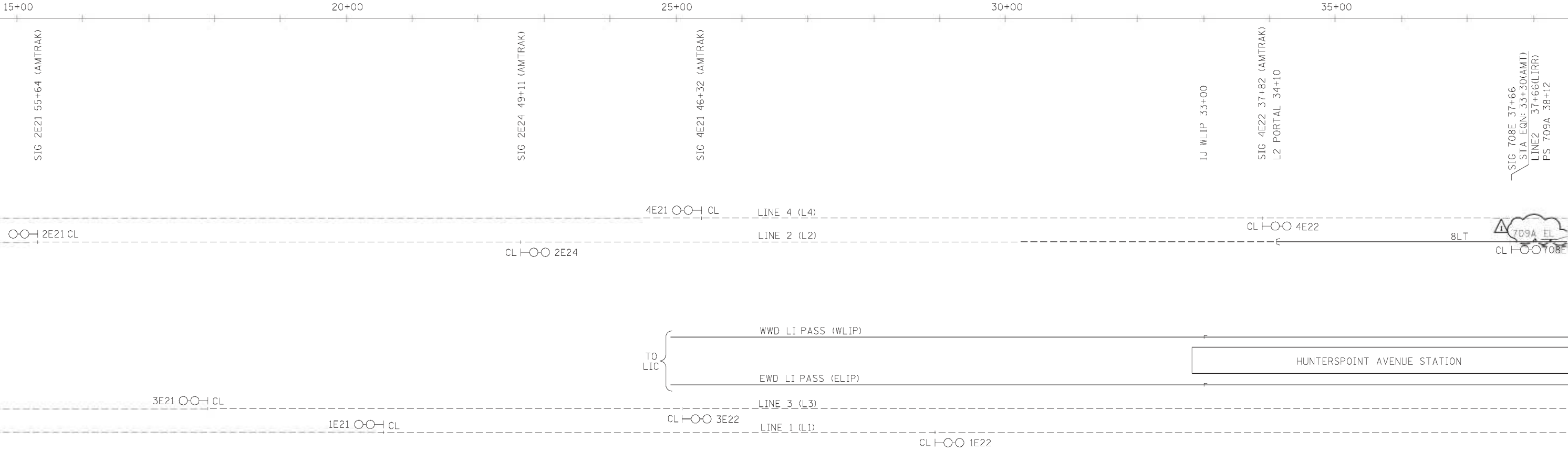
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10/8/2015

\$REF63
c:\projects\lsc\p\lsc\h\p\dms02756\p\vh051-sg-0511.dgn

CONTINUATION NONE



MATCH LINE - SEE DWG VH051-SG-0512

NOTES:
1. DRAWINGS VH051-SG-0511 TO 0516 SHOW LAYOUT IN SERVICE AFTER NEW POINT CIL CUTOVER. IT INTERFACES WITH NEW "F1" AND "F2" CIH AND EXISTING HAROLD CIL.
2. ALL SIGNALS ARE POSITION LIGHT UNLESS NOTED OTHERWISE.

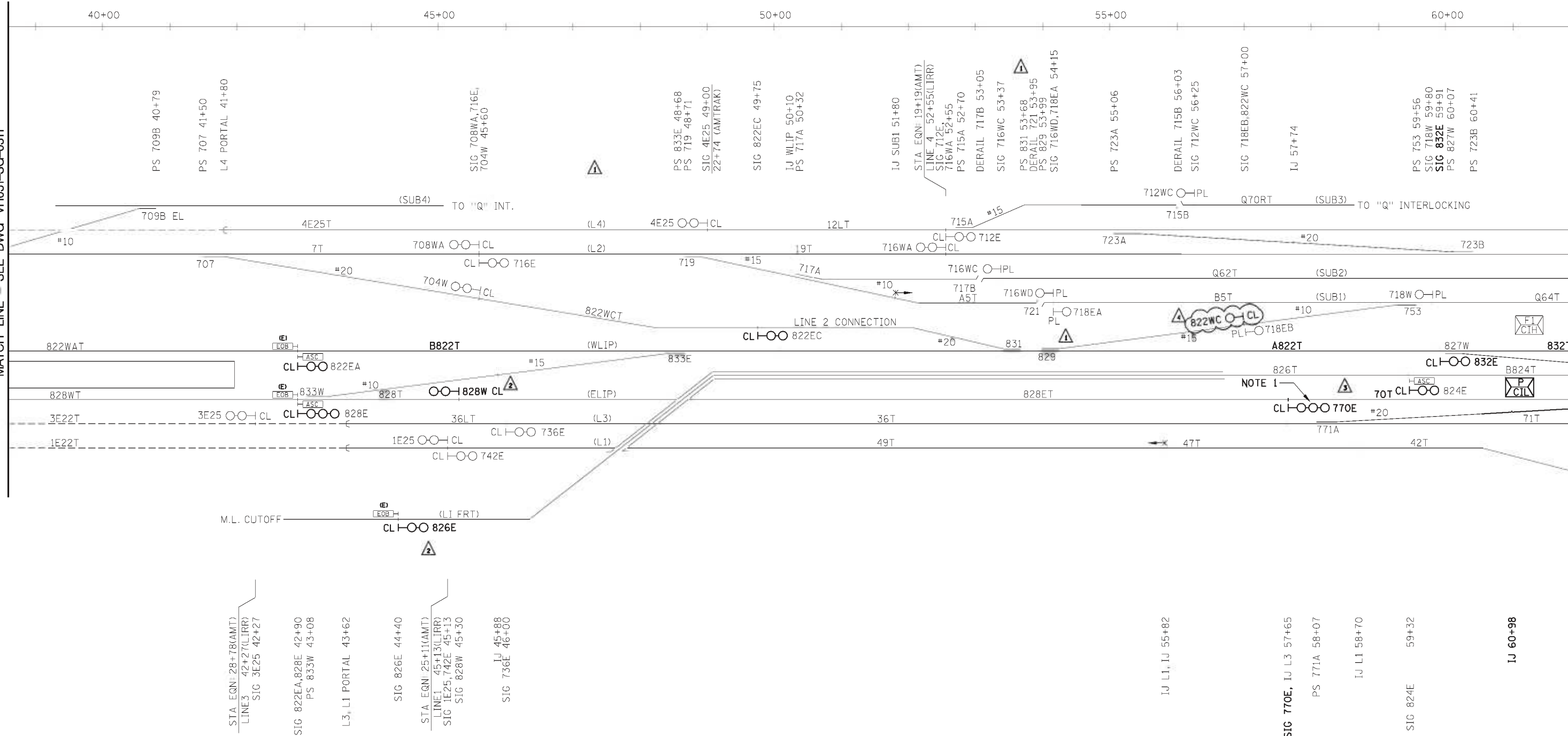
- LEGEND:
- IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT
 - SIGNAL WITH ROUTE INDICATOR
 - EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT
 - NEW LAYOUT PLACED IN SERVICE DURING THIS STAGE



REVISED DRAWING: AMPLIFYING

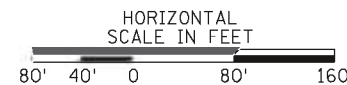
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MATCH LINE - SEE DWG VH051-SG-0513



NOTE:

1. NEW SIGNAL 770E AND TRACK CIRCUIT 70T TO BE INSTALLED AND CONTROLLED BY AMTRAK.



REVISED DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2C
SHEET 2

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0512
DATE:
8-31-09
REVISION NUMBER:
4

CONTRACT No.	VH051
ISSUE	
SHEET No.	18H OF 406



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12-14-12	SIGNAL 822WC REVISED
2-24-12	F2 SIGNALS REVISED
6-30-11	POINT SIGNALS REVISED
10-29-10	TRACK ALIGNMENT CHANGES
DATE:	REVISIONS

DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	P. BUXHOEVEDER
COORDINATED BY:	J. FREEDMAN
APPROVED BY:	T. MOORE

NY PROFESSIONAL
License No.

DATE: _____

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0512	ISSUE
DATE: 8-31-09	SHEET No. 18H OF 406
REVISION NUMBER: 4	

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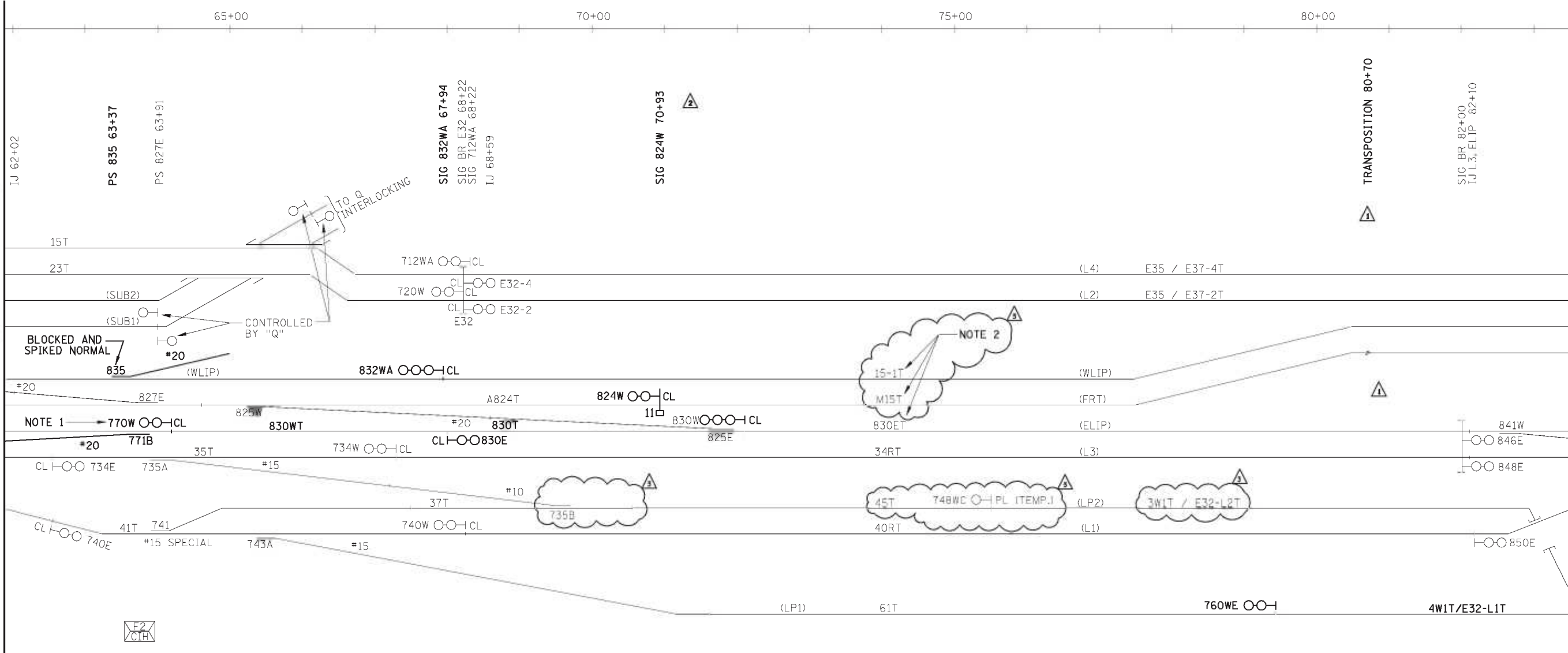
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MATCH LINE - SEE DWG VH051-SG-0512



MATCH LINE - SEE DWG VH051-SG-0514



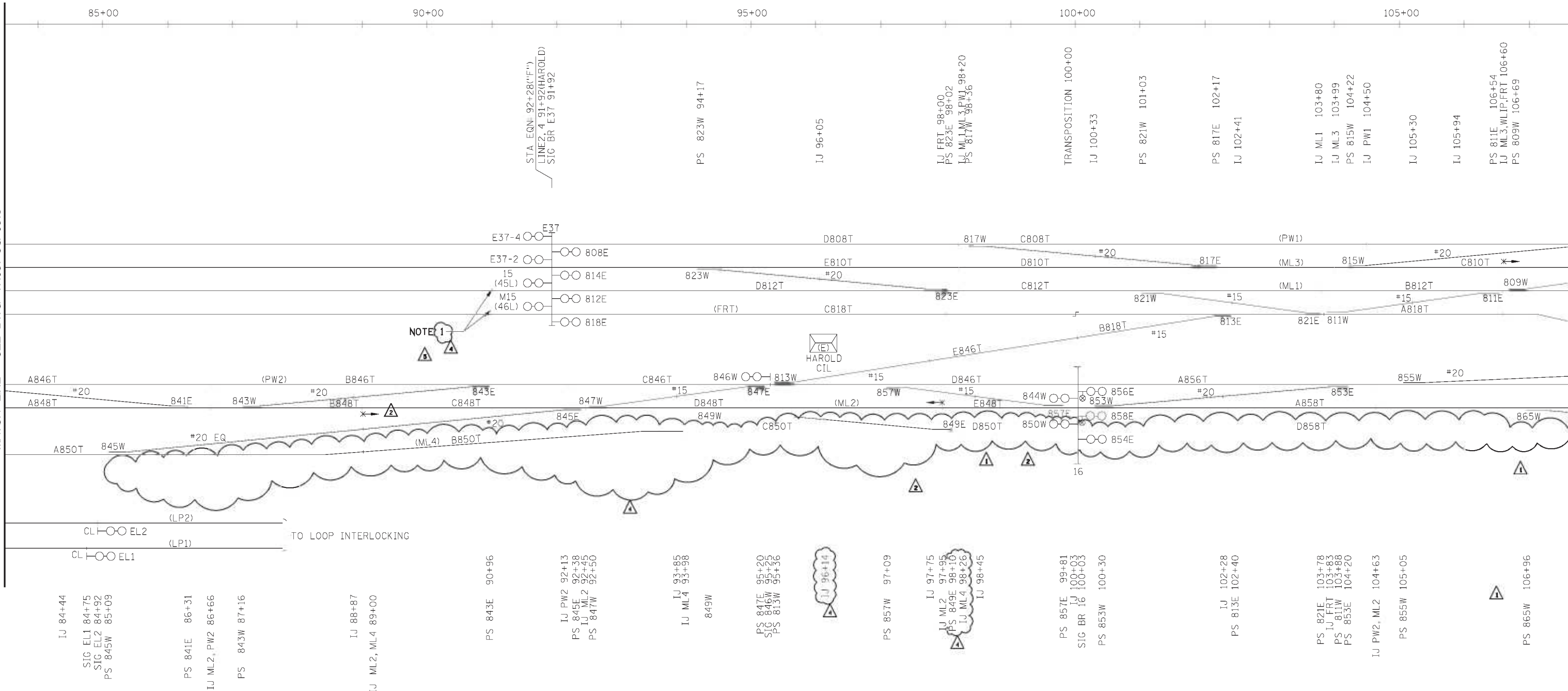
NOTES:
1. NEW SIGNAL 770W AND SWITCH 771B TO BE INSTALLED AND CONTROLLED BY AMTRAK.
2. TRACK CIRCUITS 13-4T, M13T, AND 830ET AND LINE CIRCUITS FOR THESE TRACKS ARE TEMPORARILY MAINTAINED VIA EXISTING POINT CIL.



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2-24-12	F2 TEMPORARY LAYOUT REVISED	5																													
10-31-11	CONSTRUCTION MODIFICATIONS	2																													
10-29-10	TRACK ALIGNMENT CHANGES	1																													
1-31-09	CONFORMED DRAWING	0																													
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APPROVED BY: T. MOORE																															
DATE:																															
SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0513 DATE: 8-31-09 REVISION NUMBER: 3	CONTRACT No. VH051 ISSUE SHEET No. 181 OF 406																														

MATCH LINE - SEE DWG VH051-SG-0515



NOTES:

1. SIGNALS 15 AND M15 TEMPORARY CONTROLLED VIA EXISTING POINT CIL UNTIL H3 CIL CUTOVER (STAGE 2E)

HORIZONTAL
SCALE IN FEET




80' 40' 0 80' 160'

REVISÉ DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2C
SHEET 4

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0514	ISSUE
DATE: 8-31-09	SHEET No.
REVISION NUMBER: 4	18J OF 40

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 Long Island Rail Road East Side Access		

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	2-24-12	CUTOVER SEQUENCE REVISED
	10-31-11	CONSTRUCTION SEQUENCE REVISED
	10-29-10	TRACK ALIGNMENT CHANGES
	1-31-09	CONFORMED DRAWING
	DATE:	REVISIONS

4	DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No. _____ _____ DATE: _____
3	DRAWN BY: C. IOGIN	
2	CHECKED BY: P. BUJHOEVEDEN	
1	COORDINATED BY: J. FREEDMAN	
0	APPROVED BY: T. MOORE	

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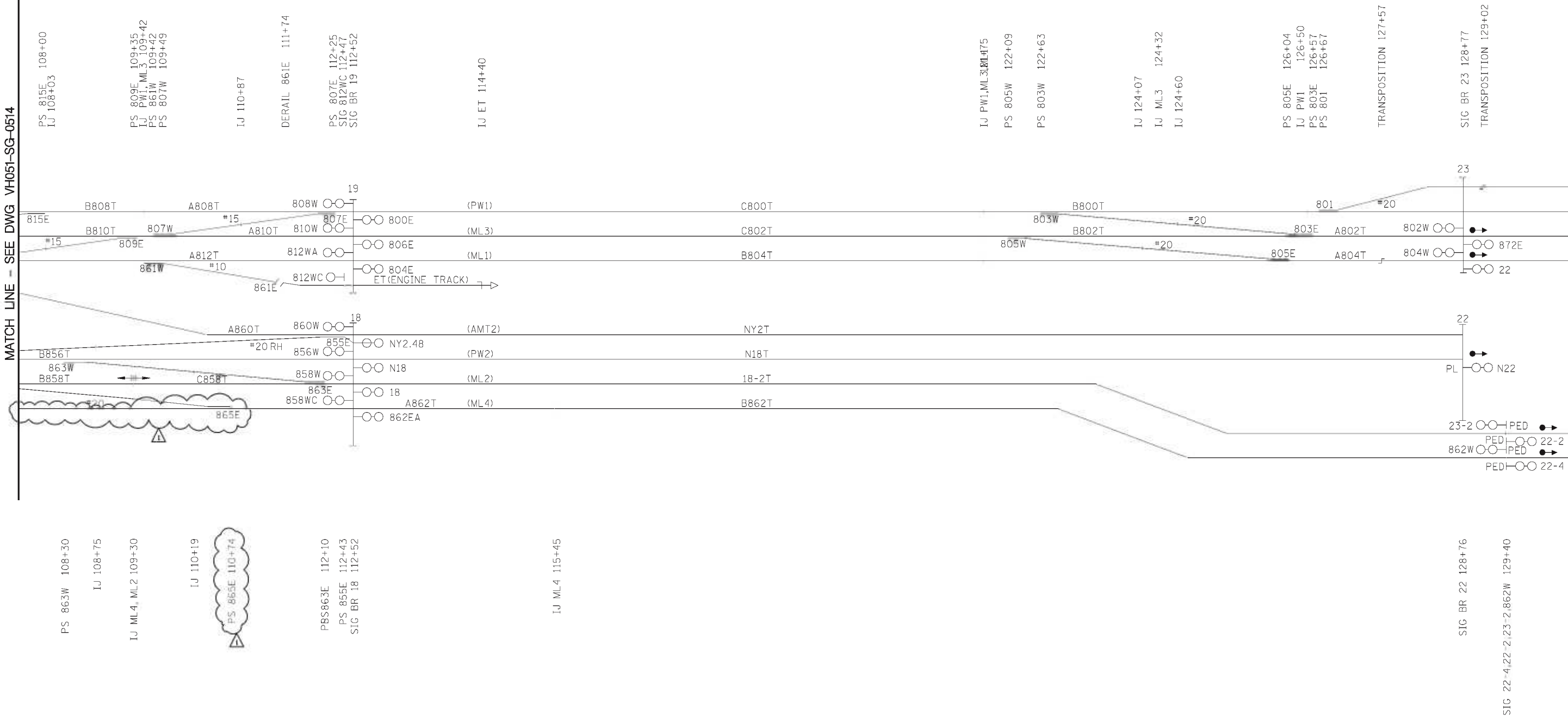
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10/8/2015

\$REF63
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MATCH LINE - SEE DWG VH051-SG-0514



MATCH LINE - SEE DWG VH051-SG-0516



REVISED DRAWING: AMPLIFYING

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Capital Construction

Long Island Rail Road
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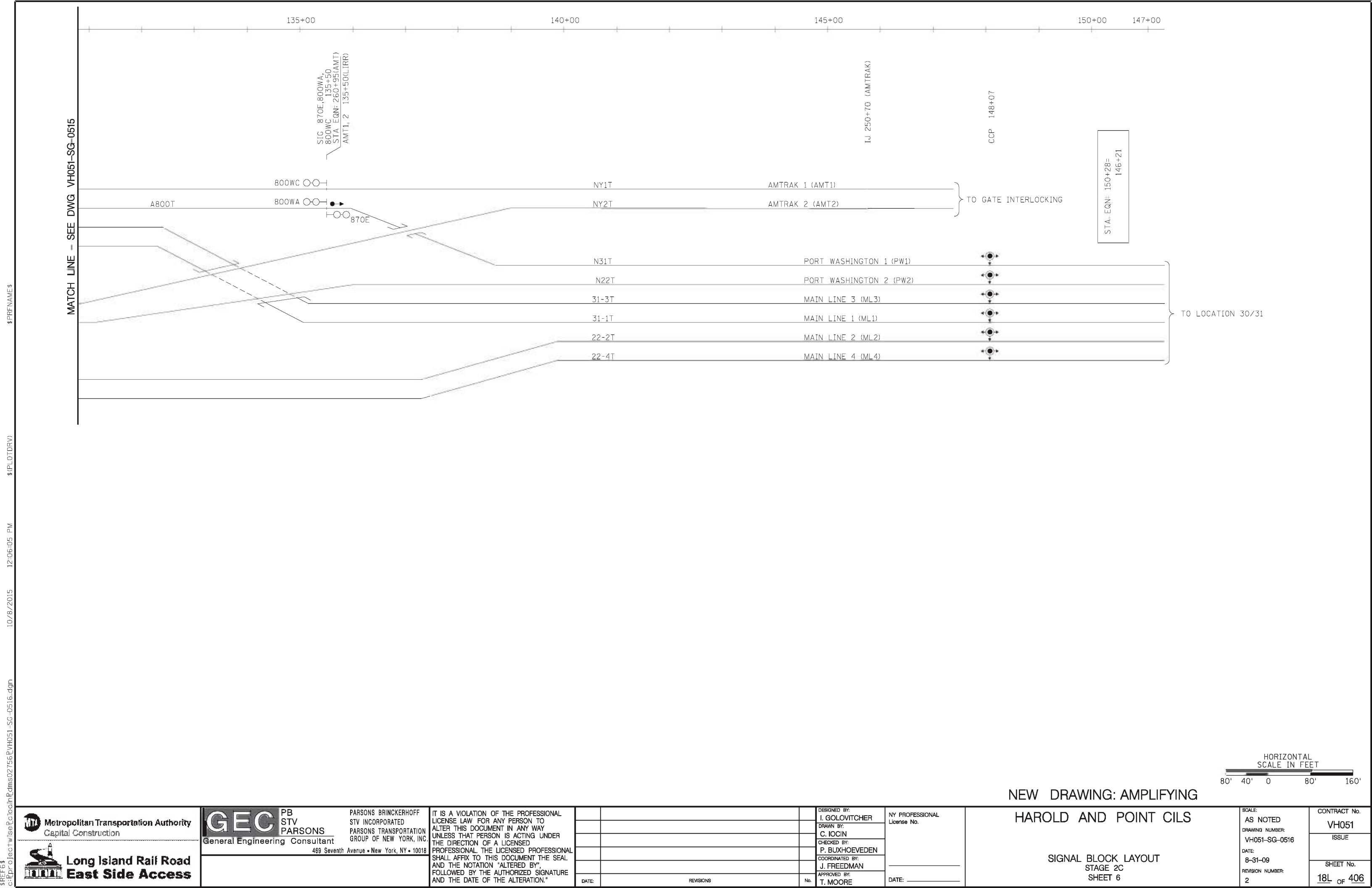
6-14-13	ML4 ROUTE REVISED	No.
DATE:	REVISIONS	

DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.
DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2C
SHEET 5

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0515 DATE: 8-31-09 REVISION NUMBER: 3	CONTRACT No. VH051 ISSUE SHEET No. 18K OF 406
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Metropolitan Transportation Authority
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Long Island Rail Road
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DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	
DATE: _____	DATE: _____

NEW DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2C
SHEET 6

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0516 DATE: 8-31-09 REVISION NUMBER: 2	CONTRACT No. VH051 ISSUE SHEET No. 18L OF 406
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\$PRNAME\$

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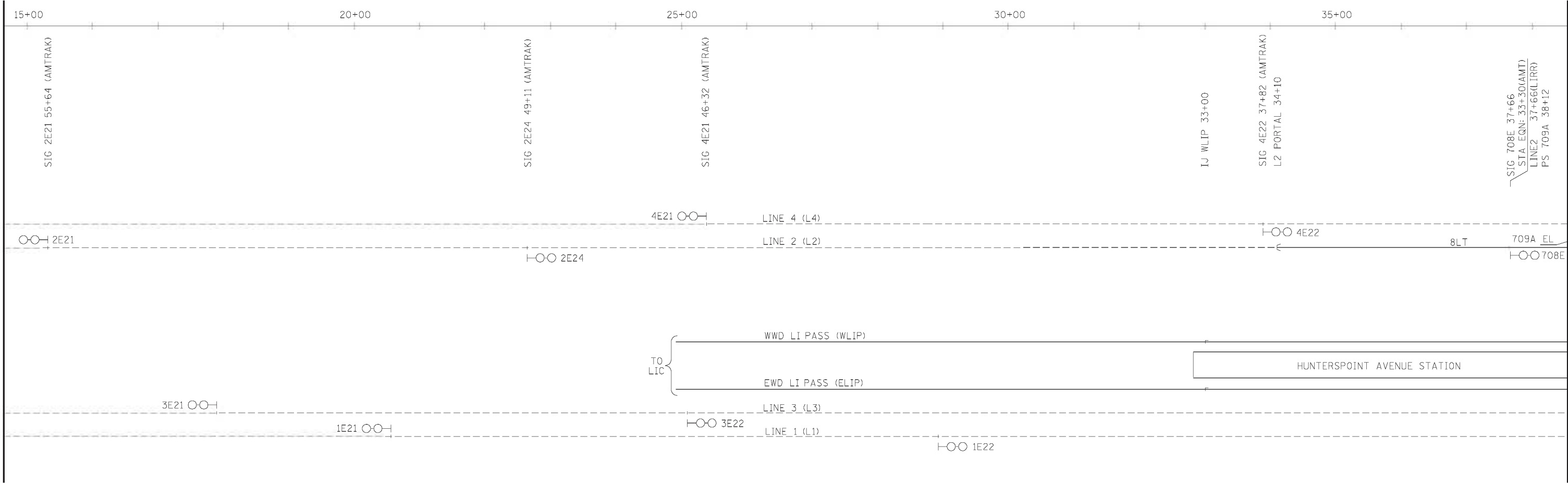
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10/8/2015

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CONTINUATION NONE



MATCH LINE - SEE DWG VH051-SG-1502

NOTES:

- DRAWINGS VH051-SG-1501 TO 1506 SHOW LAYOUT IN SERVICE AFTER HAROLD "H4" CUTOVER (STAGE 2D). NEW CILs INTERFACE WITH NEW "F2" CIH, NEW POINT CIL AND EXISTING HAROLD CIL, WHICH CONTROLS THE REMAINING PORTION OF HAROLD INTERLOCKING.
- ALL SIGNALS ARE COLOR LIGHT UNLESS NOTED OTHERWISE.

LEGEND:


- IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT
- SIGNAL WITH ROUTE INDICATOR
- EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT
- NEW LAYOUT PLACE IN SERVICE DURING THESE STAGES



NEW DRAWING: AMPLIFYING

**Metropolitan Transportation Authority**
Capital Construction

**Long Island Rail Road**
East Side Access

**PB STV PARSONS**
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DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.
DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: A. ZAMPARELLI	
APPROVED BY: T. MOORE	
DATE: _____	DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2D
SHEET 1

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-1501 DATE: 03-11-11 REVISION NUMBER:	CONTRACT No. VH051 ISSUE SHEET No. 18La OF 406
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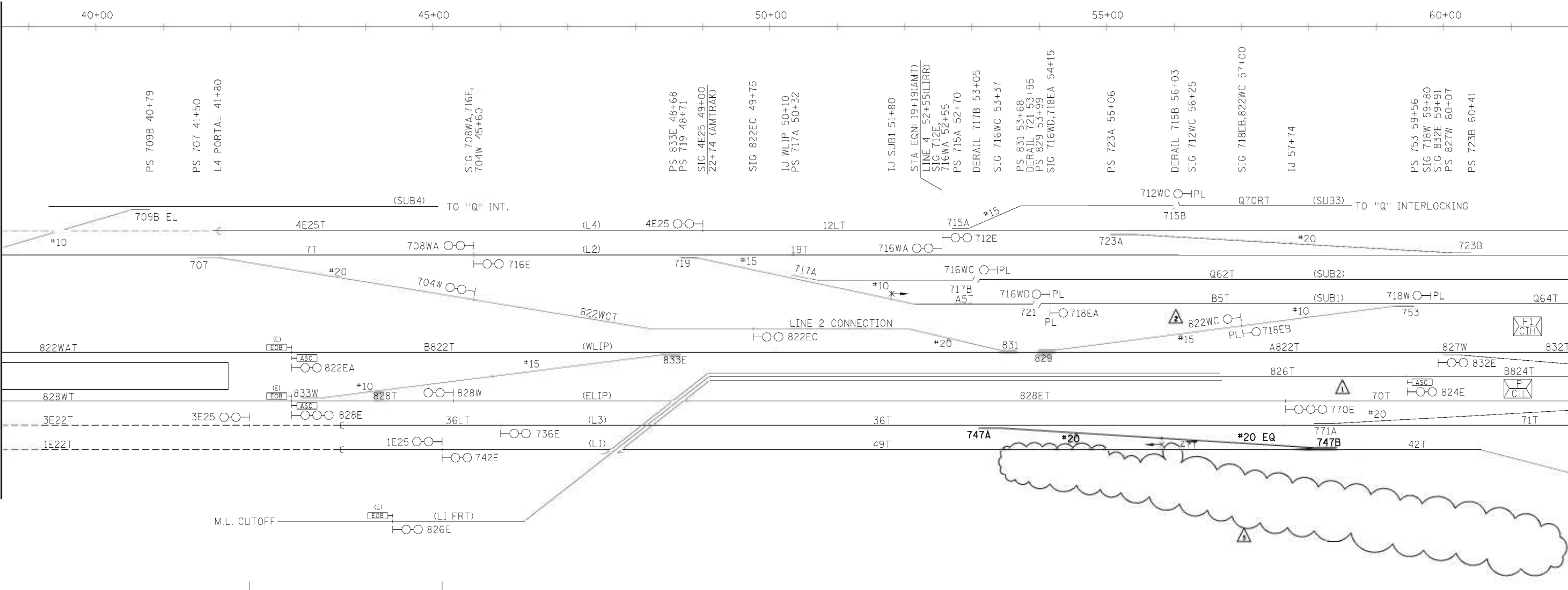
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10/8/2015

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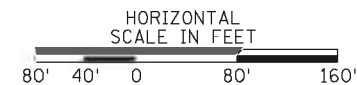
MATCH LINE - SEE DWG VH051-SG-1501

MATCH LINE - SEE DWG VH051-SG-1503



REVISED DRAWING: AMPLIFYING




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DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.																																		
DRAWN BY: C. IOGIN																																			
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COORDINATED BY: A. ZAMPARELLI																																			
APPROVED BY: T. MOORE	DATE: _____																																		
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12-14-12	SIGNAL 822WC REVISED																																		
2-24-12	F2 SIGNALS REVISED																																		
DATE:	REVISIONS	No.																																	
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DRAWING NUMBER: VH051-SG-1502	ISSUE																																		
DATE: 03-11-11	SHEET No. 18Lb OF 406																																		
REVISION NUMBER: 3																																			



HAROLD AND POINT CILS

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-1503
DATE:
03-11-11
REVISION NUMBER:
3

CONTRACT No.	VH051
ISSUE	
SHEET No.	18LC OF 400

			DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No. DATE: _____
			DRAWN BY: C. IOCIN	
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES		CHECKED BY: P. BUXHOEVEDEN	
2-24-12	F2 TEMPORARY LAYOUT REVISED		COORDINATED BY: A. ZAMPARELLI	
10-31-11	CONSTRUCTION MODIFICATIONS		APPROVED BY: JT - J. A. ...	
DATE:	REVISIONS	No.		

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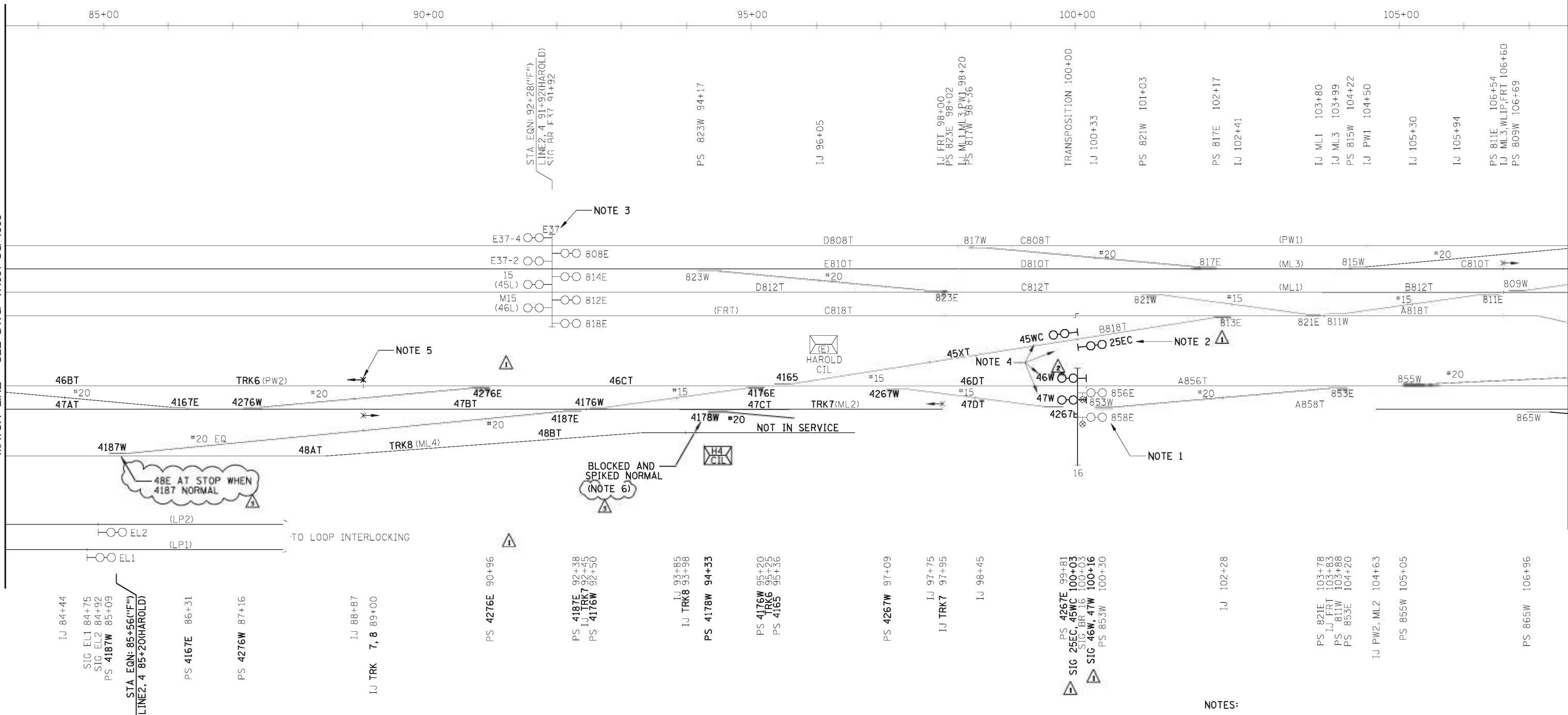
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MATCH LINE - SEE DWG VH051-SG-1503

MATCH LINE - SEE DWG VH051-SG-1505



NOTES:

1. EASTBOUND SIGNALS ON THE EXISTING BRIDGE 16 REMAIN POSITION LIGHT CONTROLLED FROM EXISTING HAROLD CIL. THEY WILL BE REPLACED WITH TEMPORARY PEDESTAL POSITION LIGHT SIGNALS WHEN THE EXISTING BRIDGE 16 IS DEMOLISHED.
2. NEW TEMPORARY SIGNAL 25EC IS CONTROLLED FROM EXISTING HAROLD CIL UNTIL STAGE 2J.
3. ALL SIGNALS ON EXISTING BRIDGE E37 REMAIN POSITION LIGHT.
4. TEMPORARY SIGNALS 25EC, 45WC, 46W AND 47W ARE STACKED COLOR LIGHT SIGNALS. THESE SIGNALS ARE IN SERVICE UNTILL THE NEW BRIDGE 16 IS INSTALLED. NEW 16 BRIDGE SHALL BE INSTALLED PRIOR TO H5 CIL CUT-OVER.
5. FIELD TO DETERMINE EXACT LOCATION OF TEMPORARY IJs ON TRACK 6. IJ's WILL BE REPLACED WITH PERMANENT IJs AT 89+22 IN STAGE 3.
6. THE EXISTING SWITCH 849W IS REPLACED IN KIND WITH NEW SWITCH 4178W WITH MPF.



REVISED DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2D
SHEET 4

Metropolitan Transportation Authority
Capital Construction

Long Island Rail Road
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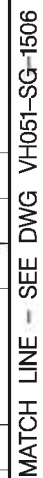
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DATE	REVISIONS	No.
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	1
2-24-12	TEMP. SIGNALS TO SUPPORT BR 16 REPLACEMENT	2
10-31-11	CONSTRUCTION SEQUENCE REVISED	3

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOCIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
A. ZAMPARELLI
APPROVED BY:
T. MOORE

NY PROFESSIONAL
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DATE:

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-1504 DATE: 03-11-11 REVISION NUMBER: 3	CONTRACT No. VH051 ISSUE SHEET No. 18Ld OF 406
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HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

SIGNAL BLOCK LAYOUT
STAGE 2D
SHEET 5

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-1505	ISSUE
DATE: 03-11-11	SHEET No. 18Le OF 40Le
REVISION NUMBER:	

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	DRAWN BY: C. IOCIN	
	CHECKED BY: P. BUXHOEVEDEN	
	COORDINATED BY: A. ZAMPARELLI	
No.	APPROVED BY: T. MOORE	
		DATE: _____

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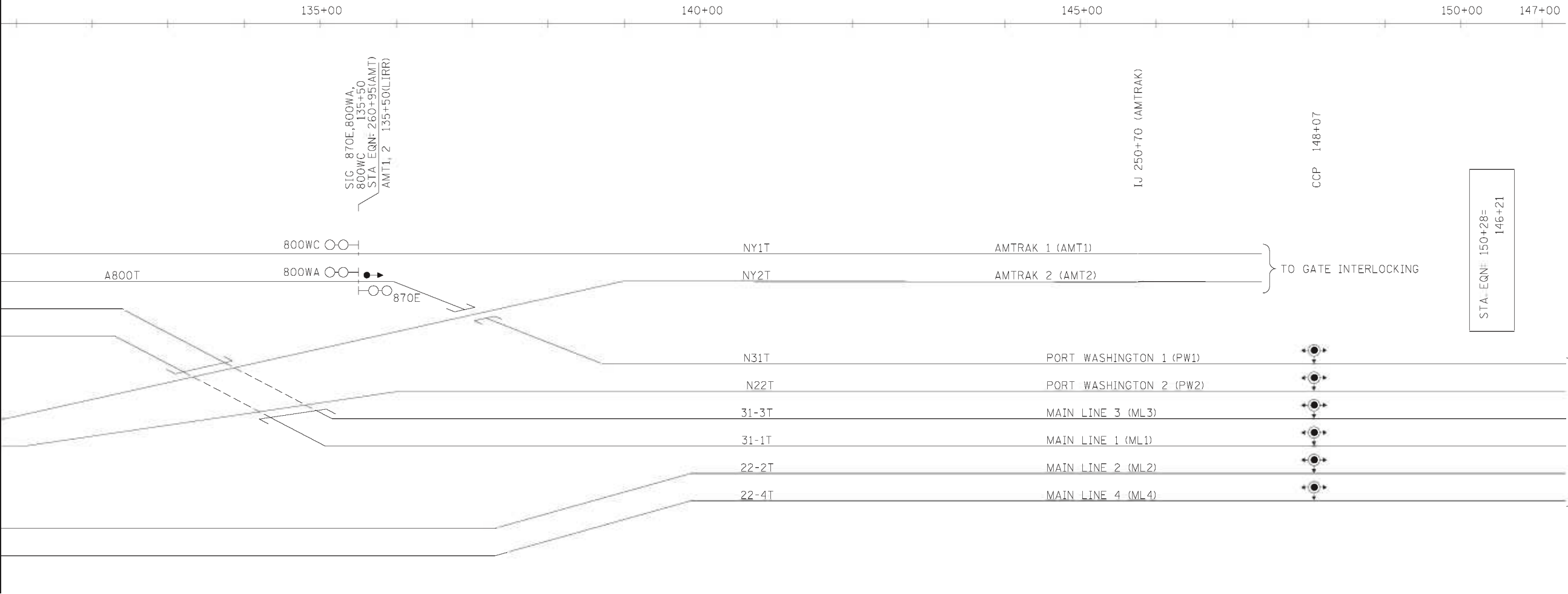
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MATCH LINE - SEE DWG VH051-SG-1505



NOTE:
1. SIGNALS 800WA, 800WC AND 870E REMAIN POSITION LIGHT SIGNALS.



NEW DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2D
SHEET 6

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Capital Construction

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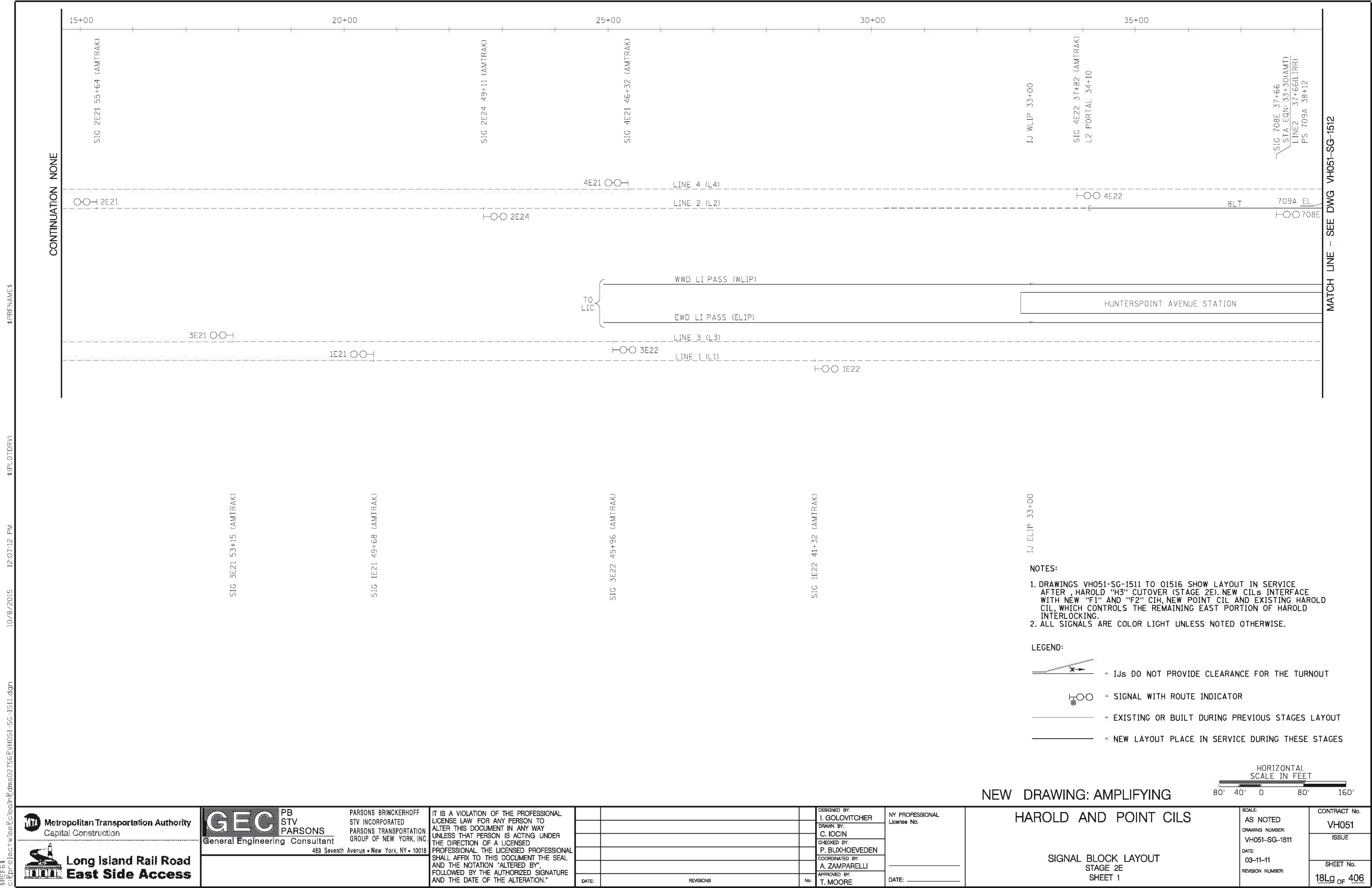
DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOCIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
A. ZAMPARELLI
APPROVED BY:
T. MOORE

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SCALE:
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DATE:
03-11-11
REVISION NUMBER:

CONTRACT No.
VH051
ISSUE
SHEET No.
181f OF 406



MATCH LINE - SEE DWG VH051-SG-1513



SIGNAL BLOCK LAYOUT
STAGE 2E
SHEET 2

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-1512
DATE:
03-11-11
REVISION NUMBER:
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CONTRACT No.
VH051
ISSUE
SHEET No.
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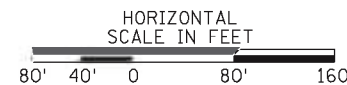
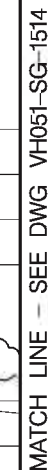
12-14-12	SIGNAL 822WC REVISED
2-24-12	F2 SIGNALS REVISED
DATE:	REVISIONS

DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	P. BUXHOEVEDER
COORDINATED BY:	A. ZAMPARELLI
APPROVED BY:	T. MOORE

NY PROFESSIONAL
License No. _____

DATE: _____

\$REF6\$
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SIGNAL BLOCK LAYOUT
STAGE 2E
SHEET 3

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-1513	ISSUE
DATE: 03-11-11	SHEET No.
REVISION NUMBER: 2	18Li OF 40

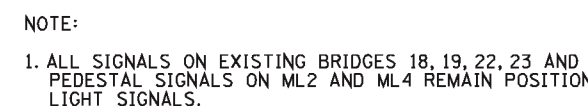


- HORIZONTAL
SCALE IN FEET
-
- 80' 40' 0 80' 160'

SIGNAL BLOCK LAYOUT
STAGE 2E
SHEET 4

<div>Metropolitan Transportation Authority Capital Construction</div> <div>Long Island Rail Road East Side Access</div>	<div>PB STV PARSONS General Engineering Consultant 489 Seventh Avenue • New York, NY • 10018</div>	PARSONS BRINCKERHOFF STV INCORPORATED PARSONS TRANSPORTATION GROUP OF NEW YORK, INC. THE DIRECTION OF A LICENSED PROFESSIONAL. THE LICENSED PROFESSIONAL SHALL AFFIX TO THIS DOCUMENT THE SEAL AND THE NOTATION "ALTERED BY", FOLLOWED BY THE AUTHORIZED SIGNATURE AND THE DATE OF THE ALTERATION."				DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No. _____ DATE: _____	HAROLD AND POINT CILS SIGNAL BLOCK LAYOUT STAGE 2E SHEET 4	SCALE: AS NOTED	CONTRACT No. VH051
		3-06-15	RE-PLANNING CONSTRUCTION ACTIVITIES		DRAWN BY: C. IOGIN	DRAWING NUMBER: VH051-SG-1514				
		9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES		CHECKED BY: P. BUXHOEVEDEN	DATE: 03-11-11				
		2-24-12	CONSTRUCTION SEQUENCE REVISED		COORDINATED BY: A. ZAMPARELLI	REVISION NUMBER: 4				
		6-30-11	TRACK ALIGNMENT CHANGES		APPROVED BY: T. MOORE	SHEET No. 18Lj OF 40				
	DATE: _____	REVISIONS	No. _____							

MATCH LINE - SEE DWG VH051-SG-1516



HORIZONTAL
SCALE IN FEET

SIGNAL BLOCK LAYOUT
STAGE 2E
SHEET 5

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-1515	ISSUE
DATE: 03-11-11	SHEET No.
REVISION NUMBER: 1	18Lk OF 40

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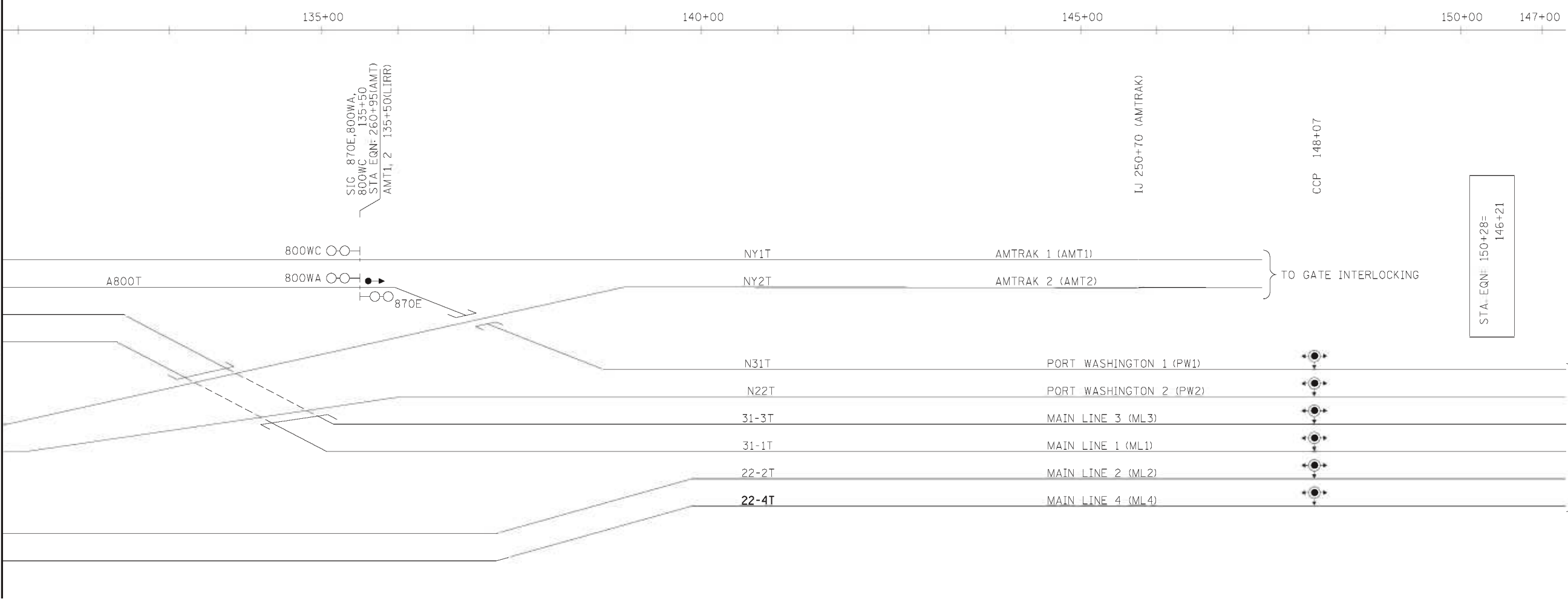
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\$REF63
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MATCH LINE - SEE DWG VH051-SG-1515



NOTE:
1. SIGNALS 800WA, 800WC AND 870E REMAIN POSITION LIGHT SIGNALS.



NEW DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2E
SHEET 6

**Metropolitan Transportation Authority**
Capital Construction

**Long Island Rail Road**
East Side Access

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DATE	REVISIONS	No.

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOCIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
A. ZAMPARELLI
APPROVED BY:
T. MOORE

NY PROFESSIONAL
License No.

DATE: _____

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-1516
DATE:
03-11-11
REVISION NUMBER:

CONTRACT No.
VH051
ISSUE
SHEET No.
181 OF 406

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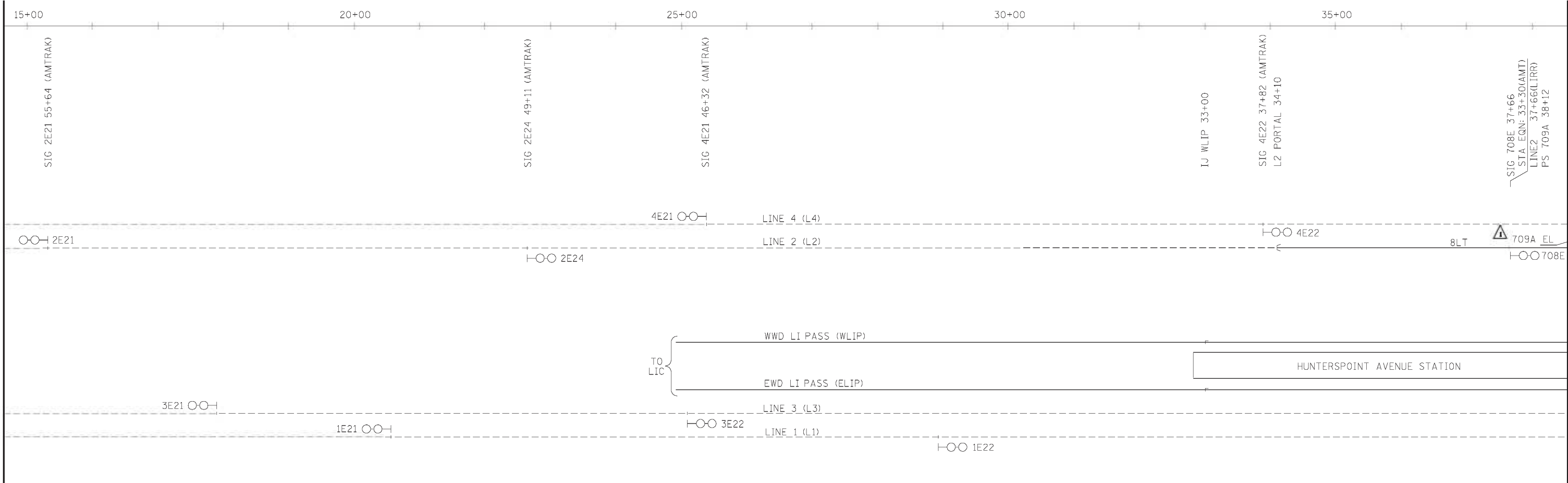
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CONTINUATION NONE



MATCH LINE - SEE DWG VH051-SG-0522

SIG 3E21 53+15 (AMTRAK)

SIG 1E21 49+68 (AMTRAK)

SIG 3E22 45+96 (AMTRAK)

SIG 1E22 41+32 (AMTRAK)

IJ ELIP 33+00

NOTES:

- DRAWINGS VH051-SG-0521 TO 0526 SHOW LAYOUT IN SERVICE AFTER LIRR PASS CONNECTOR IS PLACED IN SERVICE (STAGE 2F). NEW CILs INTERFACE WITH NEW "F1" AND "F2" CIH, NEW POINT CIL AND EXISTING HAROLD CIL, WHICH CONTROLS THE REMAINING EAST PORTION OF HAROLD INTERLOCKING.
- ALL SIGNALS ARE COLOR LIGHT UNLESS NOTED OTHERWISE.

LEGEND:

- IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT
- SIGNAL WITH ROUTE INDICATOR
- EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT
- NEW LAYOUT PLACE IN SERVICE DURING THESE STAGES




REVISED DRAWING: AMPLIFYING



Metropolitan Transportation Authority
Capital Construction





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FOLLOWED BY THE AUTHORIZED SIGNATURE
AND THE DATE OF THE ALTERATION."

03-11-11	CONSTRUCTION STAGES CLARIFIED	
10-29-10	TRACK ALIGNMENT CHANGES	
DATE:	REVISIONS	No.

DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.
DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2F
SHEET 1

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0521 DATE: 8-31-09 REVISION NUMBER: 2	CONTRACT No. VH051 ISSUE SHEET No. 18M OF 406
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MATCH LINE - SEE DWG VH051-SG-0523




SIGNAL BLOCK LAYOUT
STAGE 2F
SHEET 2

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0522	ISSUE
DATE: 8-31-09	SHEET No.
REVISION NUMBER: 4	18N OF 40



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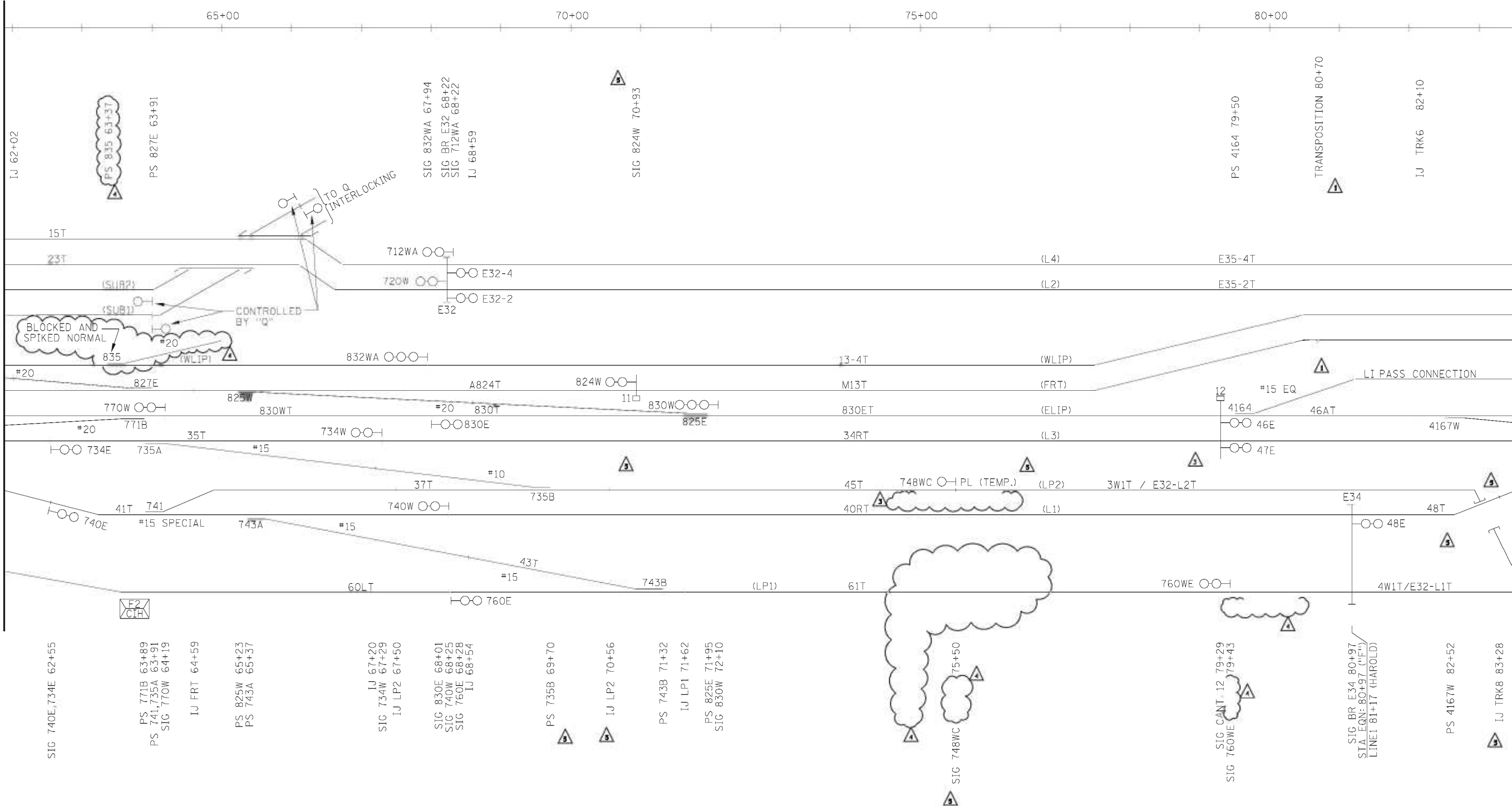
12-14-12	SIGNAL 822WC REVISED
2-24-12	F2 SIGNALS REVISED
03-11-11	CONSTRUCTION STAGES CLARIFIED
10-29-10	TRACK ALIGNMENT CHANGES
DATE:	REVISIONS

	DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No. _____ _____ DATE: _____
4	DRAWN BY: C. IOCIN	
5	CHECKED BY: P. BUXHOEVEDEN	
2	COORDINATED BY: J. FREEDMAN	
1	APPROVED BY: T. MOORE	
No.		

<h1 style="text-align: center;">HAROLD AND POINT CILS</h1> <h2 style="text-align: center;">SIGNAL BLOCK LAYOUT</h2> <p style="text-align: center;">STAGE 2F SHEET 2</p>	SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0522	CONTRACT No. VH051
	DATE: 8-31-09	ISSUE
	REVISION NUMBER: 4	SHEET No. 18N OF 40

MATCH LINE - SEE DWG VH051-SG-0522

MATCH LINE - SEE DWG VH051-SG-0524



REVISÉ DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2F
SHEET 3



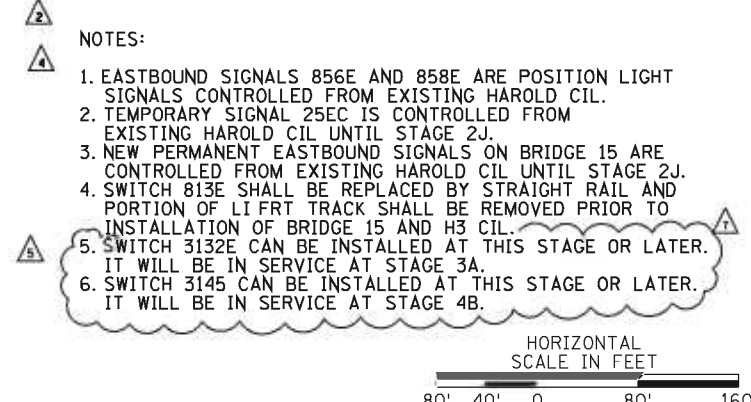
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES
2-24-12	CONSTRUCTION MODIFICATIONS
03-11-11	CONSTRUCTION STAGES CLARIFIED
10-29-10	TRACK ALIGNMENT CHANGES
DATE:	REVISIONS

	DESIGNED BY: I. GOLOVITCHER
4	DRAWN BY: C. IOCIN
3	CHECKED BY: P. BUXHOEVEDER
2	COORDINATED BY: J. FREEDMAN
1	APPROVED BY: T. MOORE
No.	

NY PROFESSIONAL
License No. _____

DATE: _____

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0523	ISSUE
DATE: 8-31-09	SHEET No. 180 OF 400
REVISION NUMBER: 4	



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CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	

SIGNAL BLOCK LAYOUT
STAGE 2F
SHEET 4

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0524	ISSUE
DATE: 8-31-09	SHEET No.
REVISION NUMBER: 7	<u>18P</u> OF 40

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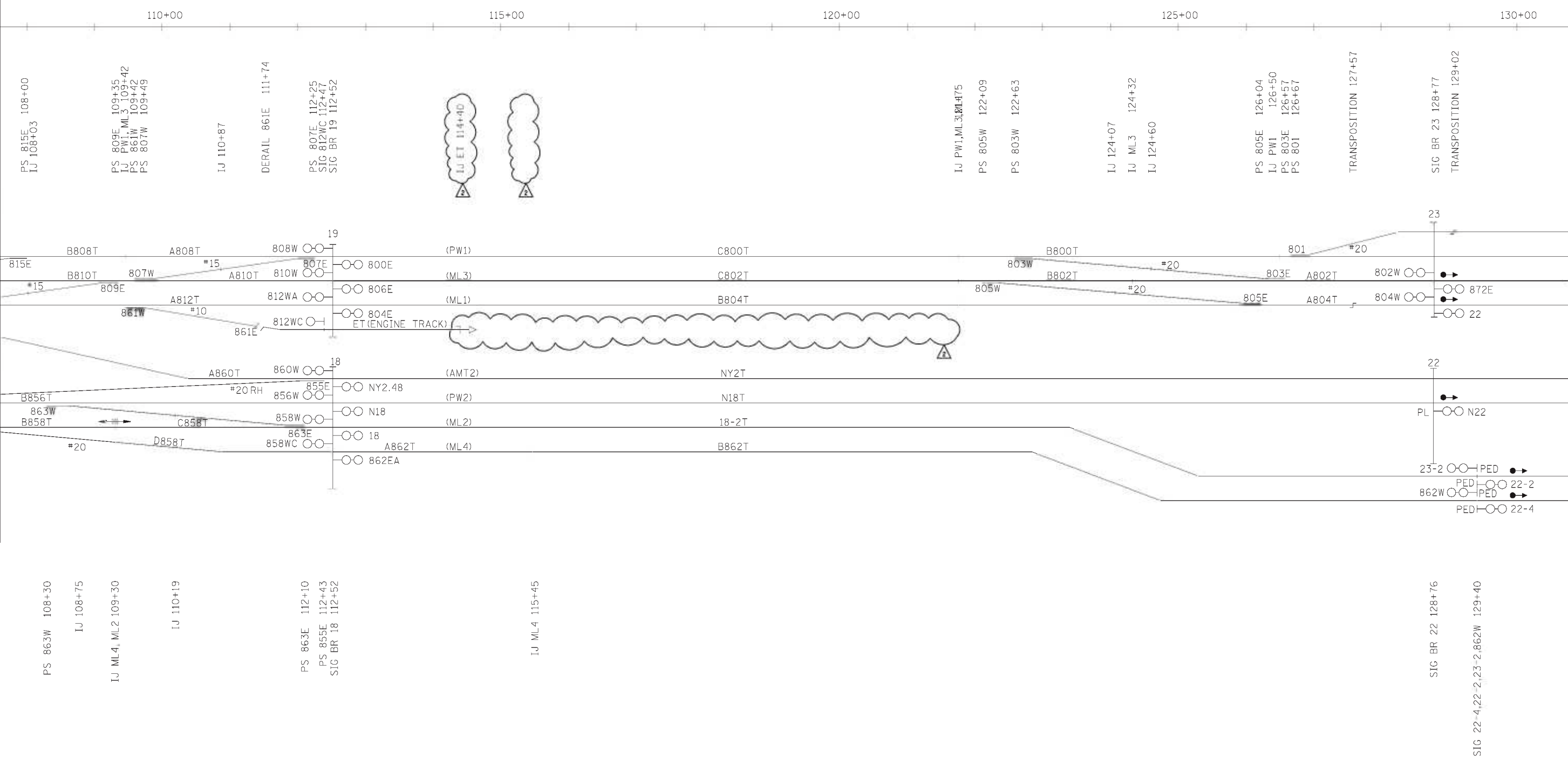
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MATCH LINE - SEE DWG VH051-SG-0524

MATCH LINE - SEE DWG VH051-SG-0526



NOTE:
1. ALL SIGNALS ON EXISTING BRIDGES 18, 19, 22, 23 AND PEDESTAL SIGNALS ON ML2 AND ML4 REMAIN POSITION LIGHT SIGNALS.



REVISED DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2F
SHEET 5

**Metropolitan Transportation Authority**
Capital Construction

**Long Island Rail Road**
East Side Access

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9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES		
03-11-11	CONSTRUCTION STAGES CLARIFIED		
DATE:	REVISIONS	No.	

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SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0525 DATE: 8-31-09 REVISION NUMBER: 2

CONTRACT No. VH051 ISSUE SHEET No. 18Q OF 406

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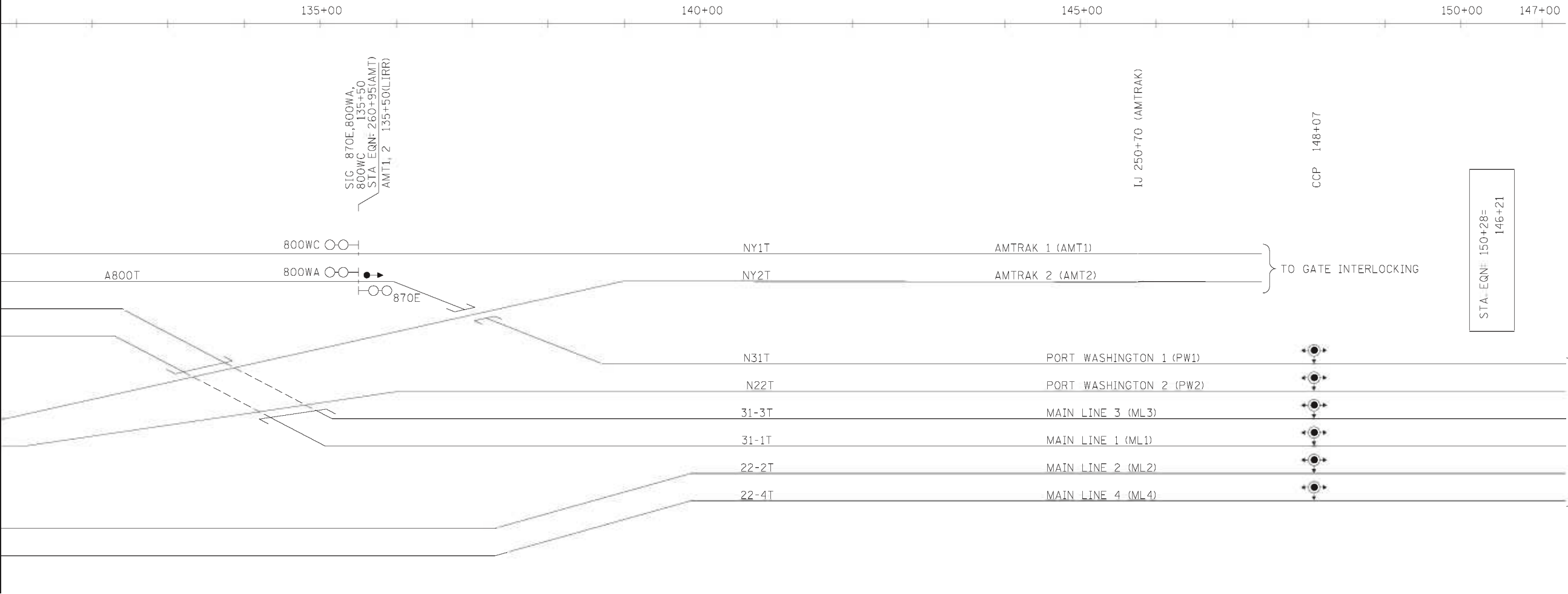
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MATCH LINE - SEE DWG VH051-SG-0525



NOTE:
1. SIGNALS 800WA, 800WC AND 870E REMAIN POSITION LIGHT SIGNALS.




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03-11-11	CONSTRUCTION STAGES CLARIFIED	
DATE:	REVISIONS	No.

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CHECKED BY: P. BUXHOEVEDEN
COORDINATED BY: J. FREEDMAN
APPROVED BY: T. MOORE

NY PROFESSIONAL License No.
DATE:

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2F
SHEET 6

SCALE: AS NOTED
DRAWING NUMBER: VH051-SG-0526
DATE: 8-31-09
REVISION NUMBER: 1

CONTRACT No. VH051
ISSUE
SHEET No. 18R OF 406

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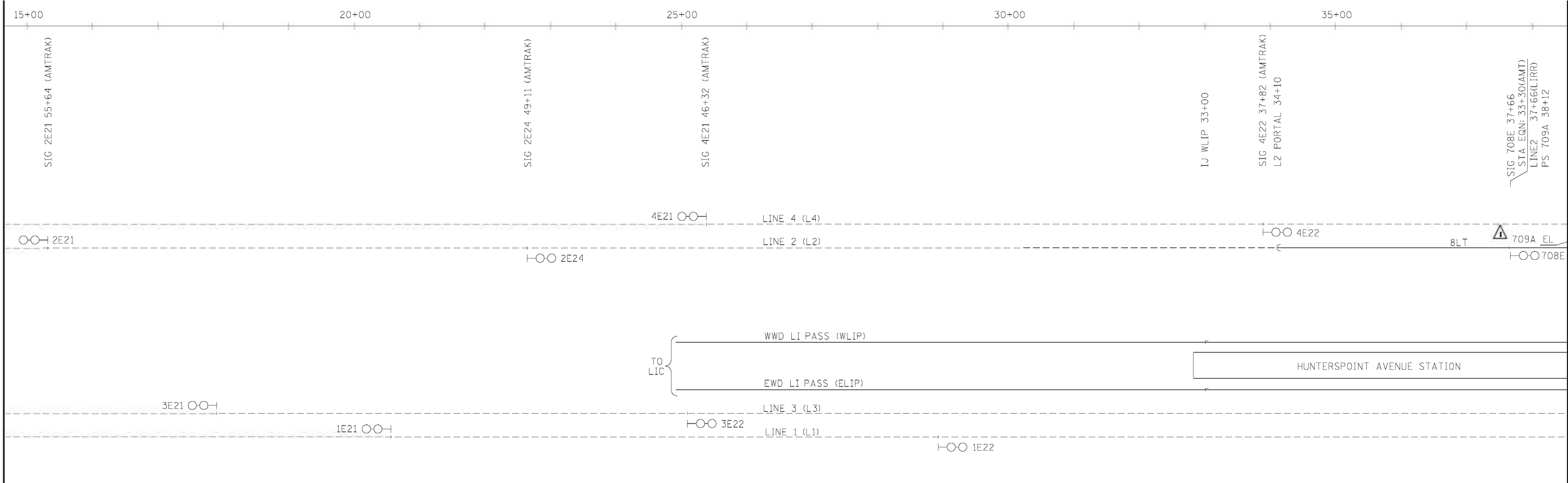
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\$REF63
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CONTINUATION NONE



MATCH LINE - SEE DWG VH051-SG-0552

SIG 3E21 53+15 (AMTRAK)

SIG 1E21 49+68 (AMTRAK)

SIG 3E22 45+96 (AMTRAK)

SIG 1E22 41+32 (AMTRAK)

IJ ELIP 33+00

- NOTES:
1. DRAWINGS VH051-SG-0551 TO 0556 SHOW SIGNAL BLOCK LAYOUT IN SERVICE AFTER HAROLD "H5" AND "H6" COMPLETE CUTOVER WHEN PERMANENT ML2 IS IN SERVICE (STAGE 2H) AND PERMANENT ML4 IS IN SERVICE (STAGE 2I)
 2. THESE DRAWINGS ALSO SHOW TEMPORARY LAYOUT WHICH WILL BE IN SERVICE FOR SOME TIME AFTER STAGE 2I CUTOVER: EASTWARD LI PASS TRACK IS REPLACED BY RUN-AROUND TRACK AND A PORTION OF LINE 3 IS REMOVED FROM SERVICE.
 3. ALL SIGNALS ARE COLOR LIGHT UNLESS NOTED OTHERWISE.
 4. STAGE 2G TRACK LAYOUT WILL NOT BE USED. INITIAL CUTOVER FOR H5, H6 AND LOC 30 CILs WILL BE DONE FOR STAGE 2H LAYOUT.

- LEGEND:
- IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT
 - SIGNAL WITH ROUTE INDICATOR
 - EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT
 - NEW LAYOUT PUT IN SERVICE DURING THESE STAGES



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9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES																													
10-29-10	TRACK ALIGNMENT CHANGES																													
DATE:	REVISIONS	No.																												
DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.																													
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DRAWING NUMBER: VH051-SG-0551	ISSUE																													
DATE: 8-31-09	SHEET No.																													
REVISION NUMBER: 2	18Y OF 406																													

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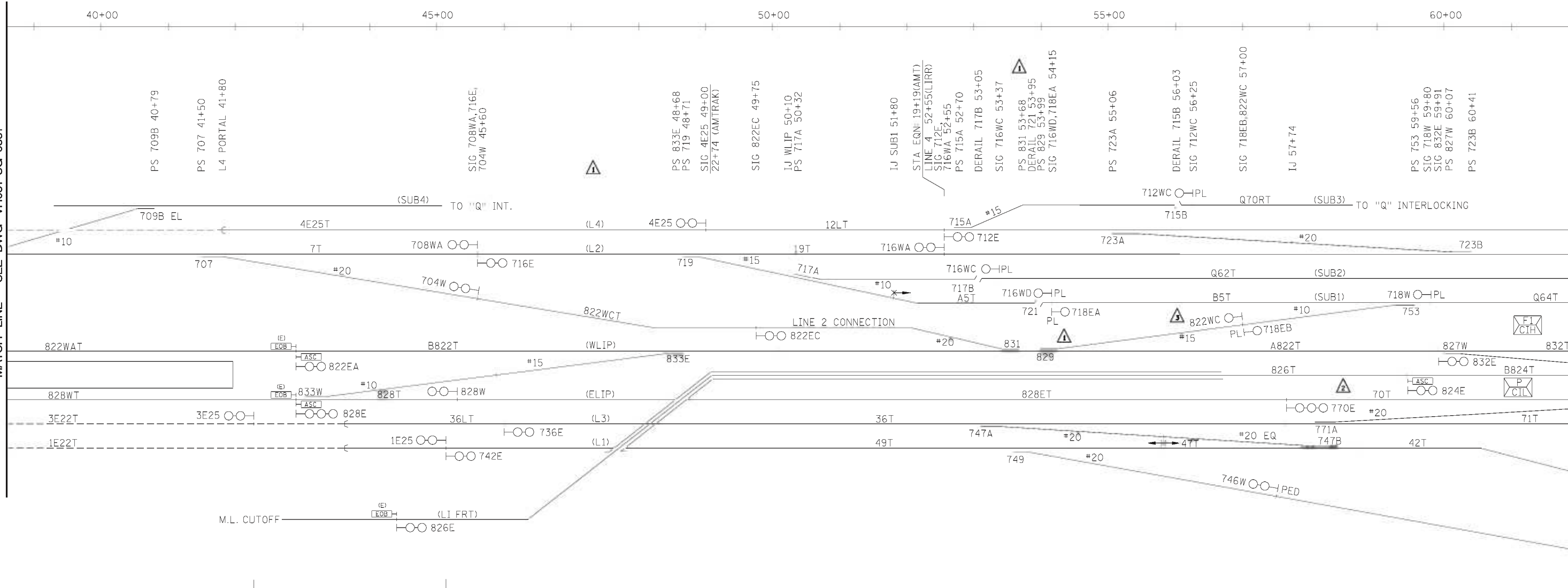
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\$REF63
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MATCH LINE - SEE DWG VH051-SG-0551

MATCH LINE - SEE DWG VH051-SG-0553



STA. EQN: 28+78(AMT)
LINE3 42+27(LIRR)
SIG 3E25 42+27

SIG 822EA, 828E 42+90
PS 833W 43+08

L3, L1 PORTAL 43+62

SIG 826E 44+40

STA. EQN: 25+11(AMT)
LINE1 45+13(LIRR)
SIG 1E25, 742E 45+13
SIG 828W 45+30

IJ 45+88
SIG 736E 46+00

PS 747A 53+10
PS 749 53+60

IJ L1, IJ 55+82

SIG 746W 57+50
SIG 770E, IJ L3 57+65

PS 771A 58+07
PS 747B 58+42
IJ L1 58+70

SIG 824E 59+32

IJ 60+98



REVISED DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
(STAGES 2H, 2I)
SHEET 2

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DATE	REVISIONS	No.
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	
12-14-12	SIGNAL 822WC REVISED	
2-24-12	F2 SIGNALS REVISED	
10-29-10	TRACK ALIGNMENT CHANGES	

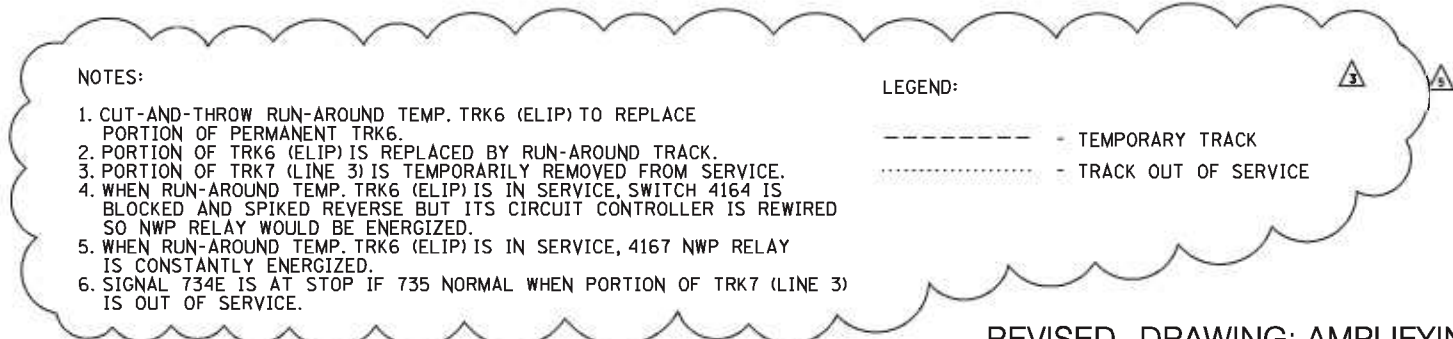
DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOGIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
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DRAWING NUMBER:
VH051-SG-0552
DATE:
8-31-09
REVISION NUMBER:
4

CONTRACT No.
VH051
ISSUE
SHEET No.
18Z OF 406



HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

CONTRACT No.	VH051
ISSUE	
SHEET No.	18AA of 406

CONTRACT No.	VH051
ISSUE	
SHEET No.	18AC OF 406

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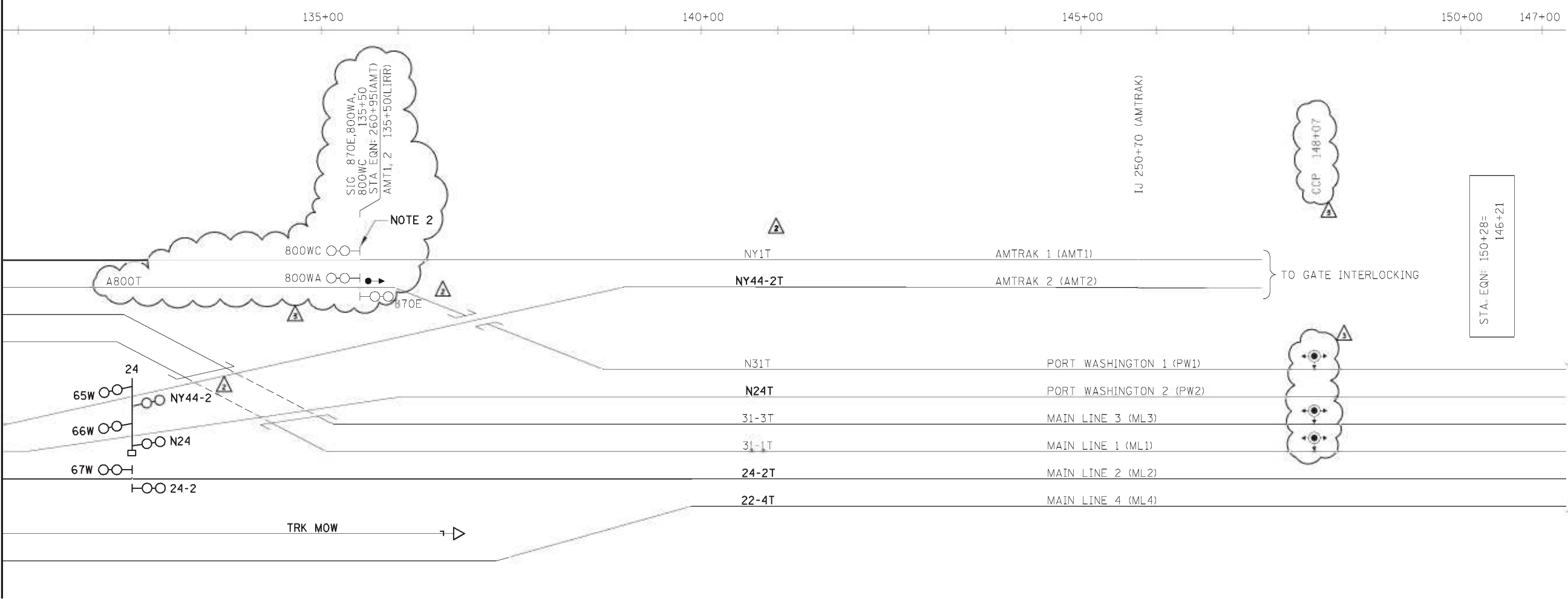
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MATCH LINE - SEE DWG VH051-SG-0555



SIG CANT. 24 132+50
SIG 67W, 24-2 132+50

IJ TRK MOW 136+60

NOTES:

1. NEW TRACK CIRCUITS N24T, 24-2T AND 22-4T WITHOUT OVERLAY TRACK CIRCUITS ARE PLACED IN SERVICE AT STAGE 2H.
2. SIGNALS 800WA, 800WC AND 870E ARE POSITION LIGHT SIGNALS CONTROLLED FROM EXISTING HAROLD CIL.



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DATE	REVISIONS	No.
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	1
12-14-12	AMTRAK NOMENCLATURE REVISED	2
2-24-12	CONSTRUCTION SEQUENCE REVISED	3

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C. IOGIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
T. MOORE

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DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
(STAGES 2H, 2)
SHEET 6

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0556
DATE:
8-31-09
REVISION NUMBER:
3

CONTRACT No.
VH051
ISSUE
SHEET No.
18AD OF 406

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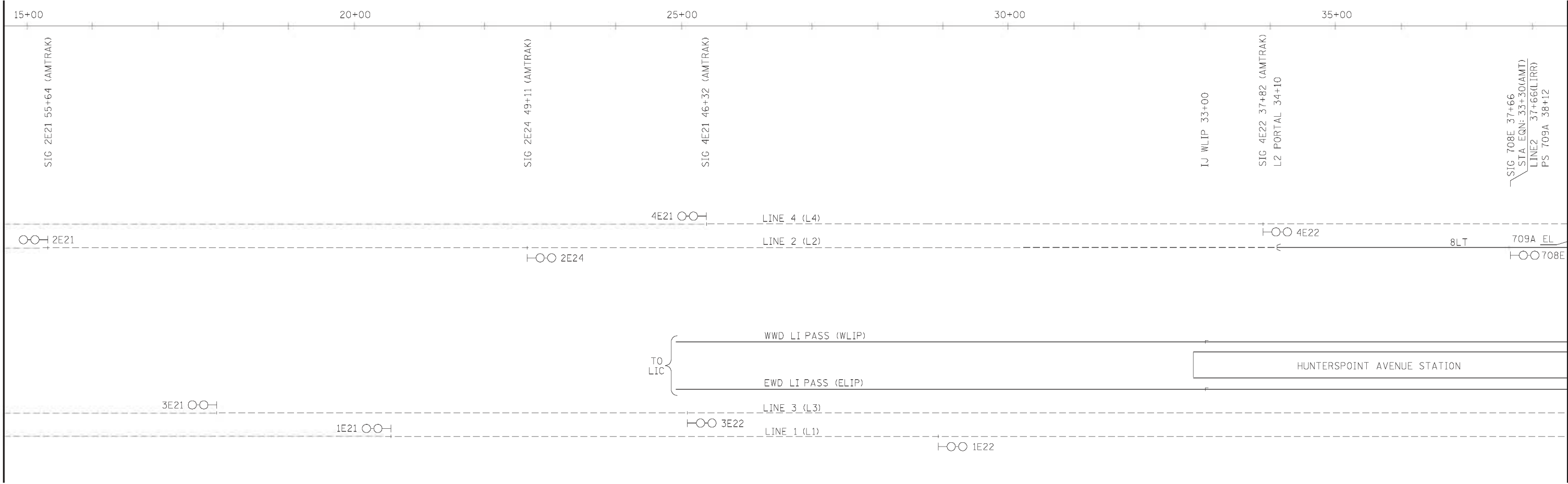
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CONTINUATION NONE



MATCH LINE - SEE DWG VH051-SG-1522

NOTES:

- DRAWINGS VH051-SG-0551 TO 0556 SHOW SIGNAL BLOCK LAYOUT IN SERVICE AFTER HAROLD "H1" AND "H2" CILs CUTOVER (STAGE 2J). AFTER COMPLETION OF STAGE 2J, ALL HAROLD INTERLOCKING IS CONTROLLED FROM NEW CILs.
- ALL SIGNALS ARE COLOR LIGHT UNLESS NOTED OTHERWISE.

LEGEND:

- IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT
- SIGNAL WITH ROUTE INDICATOR
- EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT
- NEW LAYOUT PLACE IN SERVICE DURING THESE STAGES



NEW DRAWING: AMPLIFYING

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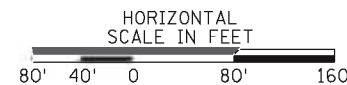
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DRAWN BY: C. IOCIN	
CHECKED BY: M. ROSEN	
COORDINATED BY: A. ZAMPARELLI	
APPROVED BY: D. LEVERENZ	
DATE: _____	DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2J
SHEET 1

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-1521 DATE: 9-19-14 REVISION NUMBER:	CONTRACT No. VH051 ISSUE SHEET No. 18AE OF 406
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MATCH LINE - SEE DWG VH051-SG-1523



HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2J
SHEET 2

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-1522
DATE:
9-19-14
REVISION NUMBER:

CONTRACT No.
VH051
ISSUE
SHEET No.
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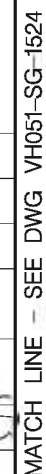
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DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	M. ROSEN
COORDINATED BY:	A. ZAMPARELLI
APPROVED BY:	D. LEVERENZ

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SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-1522	ISSUE
DATE: 9-19-14	SHEET No. 18A OF 406
REVISION NUMBER:	



REVISÉ DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2J
SHEET 3

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-1523
DATE:
9-19-14
REVISION NUMBER:
1

CONTRACT No.
VH051
ISSUE
SHEET No.
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3-06-15	BE-PLANNING CONSTRUCTION ACTIVITIES
---------	-------------------------------------

DATE:	REVISIONS
-------	-----------

	No

DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	M. ROSEN
COORDINATED BY:	A. ZAMPARELLI
APPROVED BY:	D. LEVERENZ

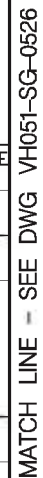
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License No.

DATE: _____

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c:\proj



SIGNAL BLOCK LAYOUT
STAGE 2J
SHEET 4



HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-1525	ISSUE
DATE: 9-19-14	SHEET No. 18A of 40
REVISION NUMBER:	

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MATCH LINE - SEE DWG VH051-SG-1525

135+00

140+00

145+00

150+00

147+00

SIG 11W, 12W,
NY1, PW1E 135+50
STA EQN: 260+95(AMT)
AMT1, 2 135+50(LIRR)

IJ 250+70 (AMTRAK)

11AT

11W

12W

NY44-1

PW1E

NY44-1T

AMTRAK 1 (AMT1)

NY44-2T

AMTRAK 2 (AMT2)

TO GATE INTERLOCKING

STA EQN: 150+28=
146+21

65W
66W
67W

24

NY44-2

N24

24-2

N31T

PORT WASHINGTON 1 (PW1)

N24T

PORT WASHINGTON 2 (PW2)

31-3T

MAIN LINE 3 (ML3)

31-1T

MAIN LINE 1 (ML1)

24-2T

MAIN LINE 2 (ML2)

22-4T

MAIN LINE 4 (ML4)

TO LOCATION 30/31

NOT IN SERVICE

SIG CANT. 24 132+50
SIG 67W, 24-2 132+50

NOTE:

1. SIGNALS 800WA, 800WC AND 870E REMAIN POSITION
LIGHT SIGNALS.

HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

NEW DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 2J
SHEET 6

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DATE:

REVISIONS

No.

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOGIN
CHECKED BY:
M. ROSEN
COORDINATED BY:
A. ZAMPARELLI
APPROVED BY:
D. LEVERENZ

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License No.

DATE:

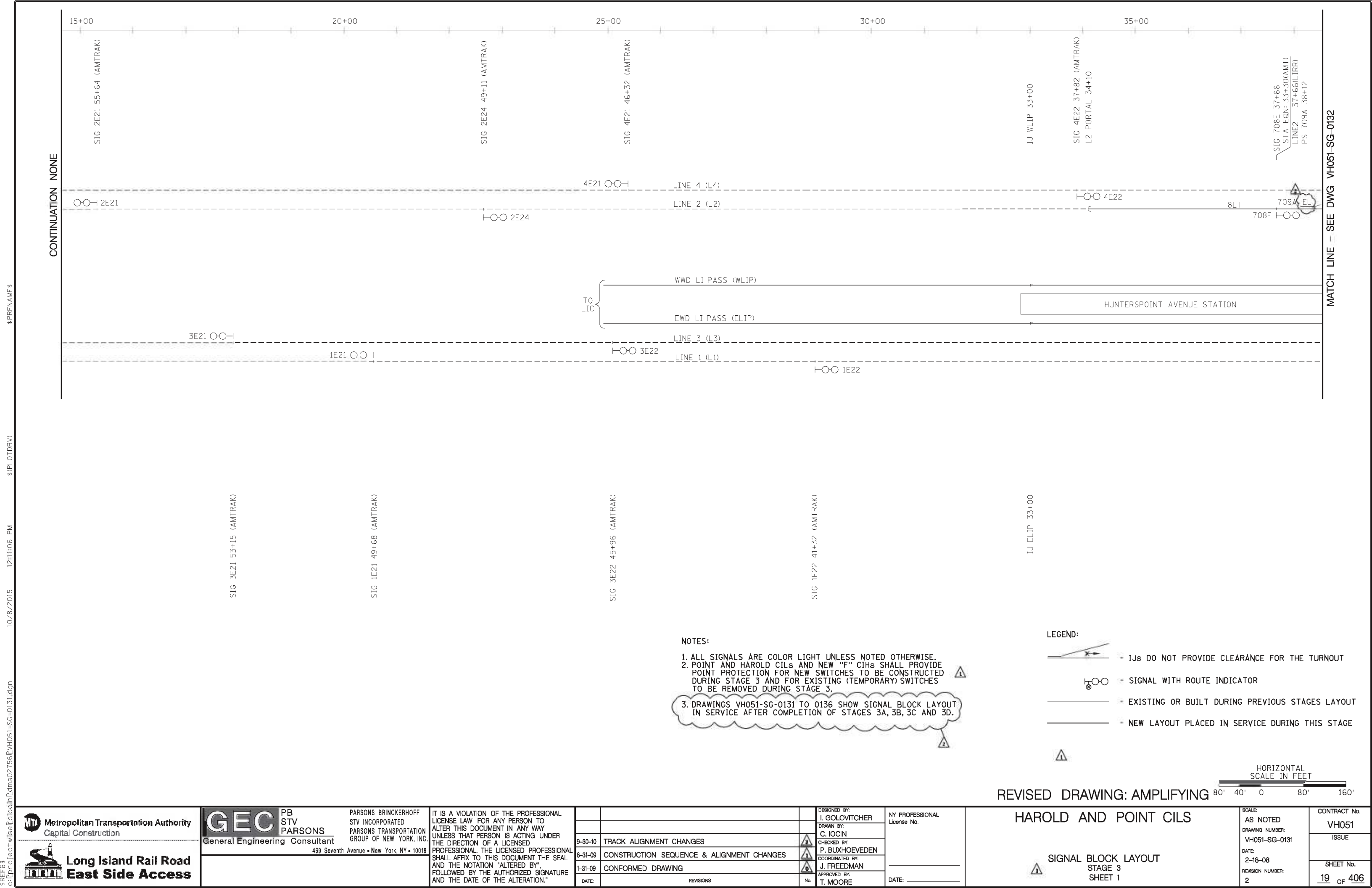
CONTRACT No.

VH051

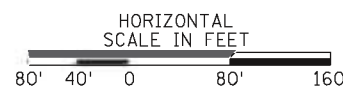
ISSUE

SHEET No.

18AJ OF 406



MATCH LINE - SEE DWG VH051-SG-0133



SIGNAL BLOCK LAYOUT
STAGE 3
SHEET 2

HAROLD AND POINT CILS

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0132
DATE:
2-18-08
REVISION NUMBER:
4

CONTRACT No.
VH051
ISSUE
SHEET No.
20 OF 406



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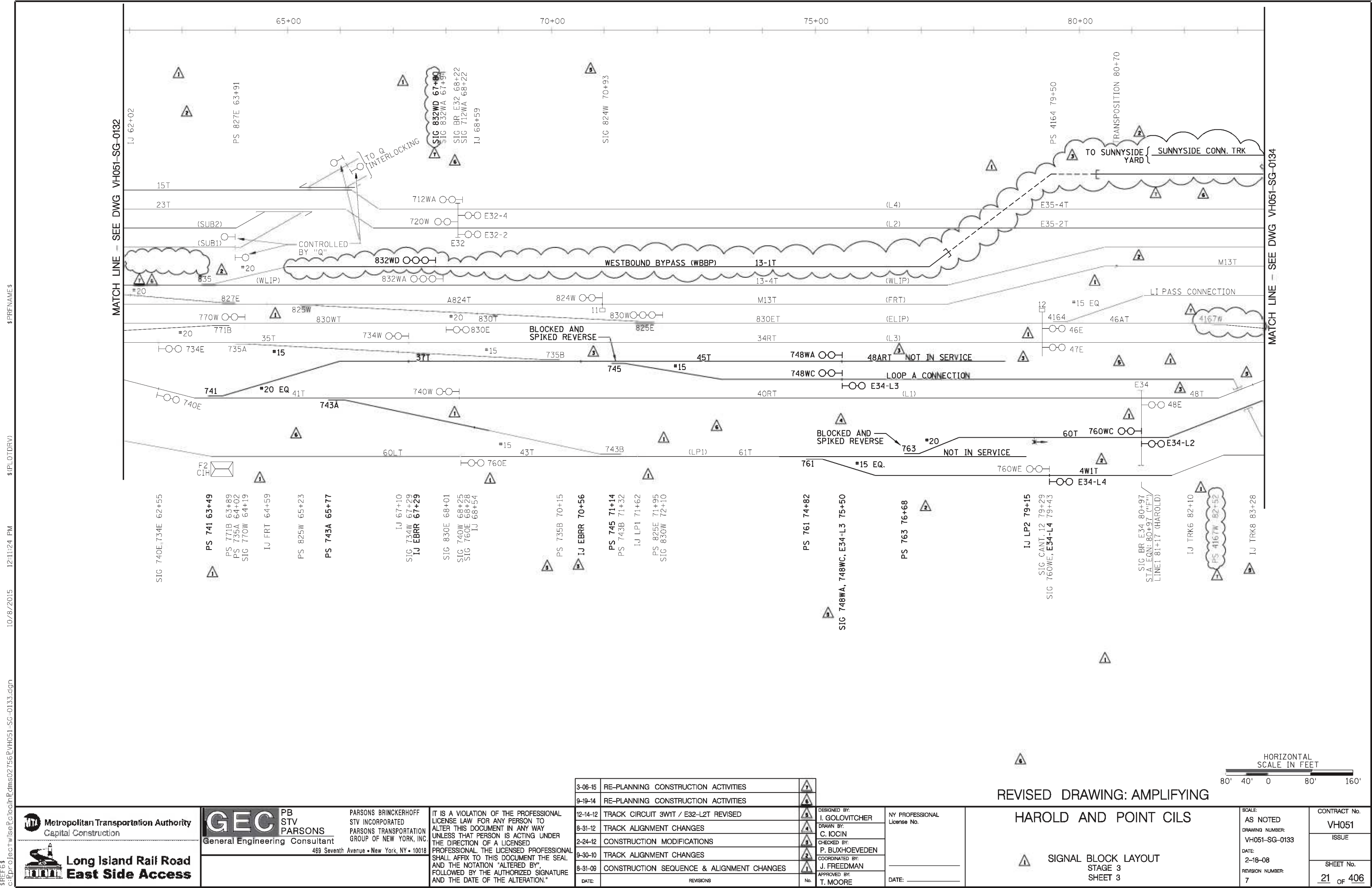
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AND THE DATE OF THE ALTERATION."

12-14-12	SIGNAL 822WC REVISED
2-24-12	F2 SIGNALS REVISED
9-30-10	TRACK ALIGNMENT CHANGES
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES
1-31-09	CONFORMED DRAWING
DATE:	REVISIONS

DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No. _____ _____ DATE: _____
DRAWN BY: C. IOGIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	

NY PROFESSIONAL
License No.

4	DESIGNED BY: I. GOLOVITCHER
3	DRAWN BY: C. IOCIN
2	CHECKED BY: P. BUXHOEVEDER
1	COORDINATED BY: J. FREEDMAN
0	APPROVED BY: T. MOORE
No.	

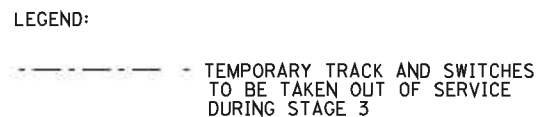


3-06-15	RE-PLANNING CONSTRUCTION ACTIVITIES	1
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	6
12-14-12	TRACK CIRCUIT 3W1T / E32-L2T REVISED	8
8-31-12	TRACK ALIGNMENT CHANGES	4
2-24-12	CONSTRUCTION MODIFICATIONS	5
9-30-10	TRACK ALIGNMENT CHANGES	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
DATE:	REVISIONS	No.

DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.
DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	
DATE:	

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0133 DATE: 2-18-08 REVISION NUMBER: 7	CONTRACT No. VH051 ISSUE SHEET No. 21 OF 406
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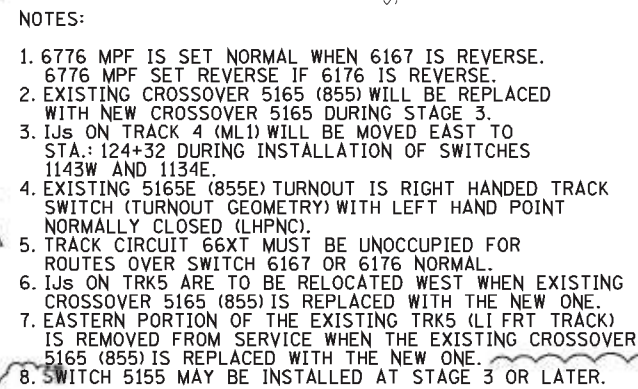
MATCH LINE - SEE DWG VH051-SG-0135



 SIGNAL BLOCK LAYOUT
STAGE 3
SHEET 4


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DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	
DATE: _____	

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0134	ISSUE
DATE: 2-18-08	SHEET No. <u>22</u> OF 406
REVISION NUMBER: 8	



REVISÉ DRAWING: AMPLIFYING

HAROLD AND POINT CILS

 SIGNAL BLOCK LAYOUT
STAGE 3
SHEET 5

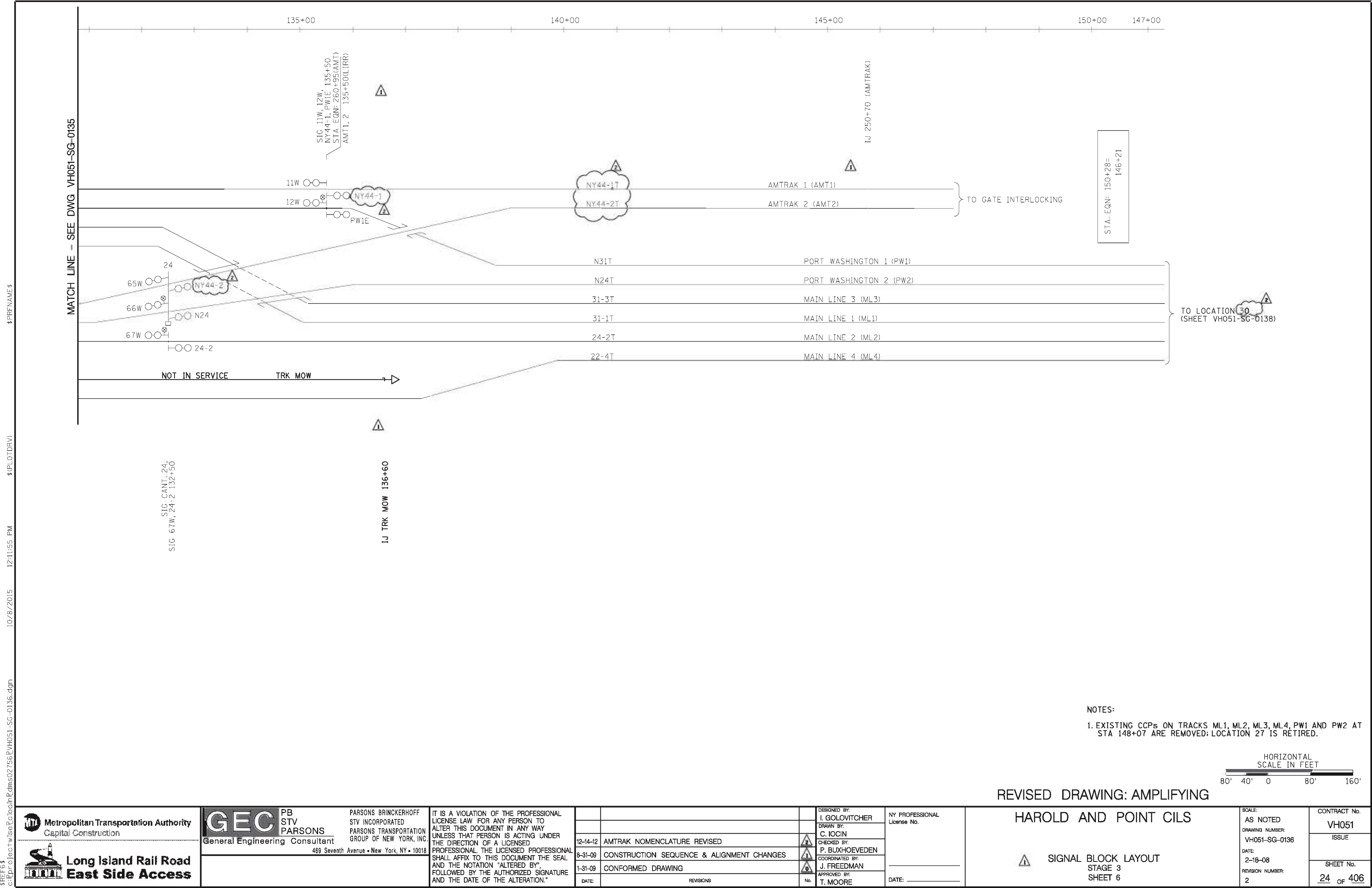
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DRAWING NUMBER: VH051-SG-0135	ISSUE
DATE: 2-18-08	SHEET No. 23 of 40
REVISION NUMBER: 0	

3-06-15	RE-PLANNING CONSTRUCTION ACTIVITIES	9
11-26-14	RE-PLANNING CONSTRUCTION ACTIVITIES	8
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	7
6-14-13	TRACK CIRCUIT 2-36T REVISED	6
12-14-12	SWITCH CLEARANCE CONDITIONS ADDED	5
5-31-12	NOTE 4 CORRECTED	4
2-24-12	REVISED SIGNALS FOR ESA TUNNEL APPROACHES	3
9-30-10	TRACK ALIGNMENT CHANGES	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1

DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	P. BUXHOEVED
COORDINATED BY:	J. FREEDMAN
APPROVED BY:	T. MOORE

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DATE:



NOTES:
1. EXISTING CCPs ON TRACKS ML1, ML2, ML3, ML4, PW1 AND PW2 AT STA 148+07 ARE REMOVED; LOCATION 27 IS RETIRED.



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DATE	REVISIONS	No.
12-14-12	AMTRAK NOMENCLATURE REVISED	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
1-31-09	CONFORMED DRAWING	0

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOGIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
T. MOORE

NY PROFESSIONAL License No.
DATE: _____

HAROLD AND POINT CILS

 SIGNAL BLOCK LAYOUT
STAGE 3
SHEET 6

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0136
DATE:
2-18-08
REVISION NUMBER:
2

CONTRACT No.
VH051
ISSUE
SHEET No.
24 OF 406

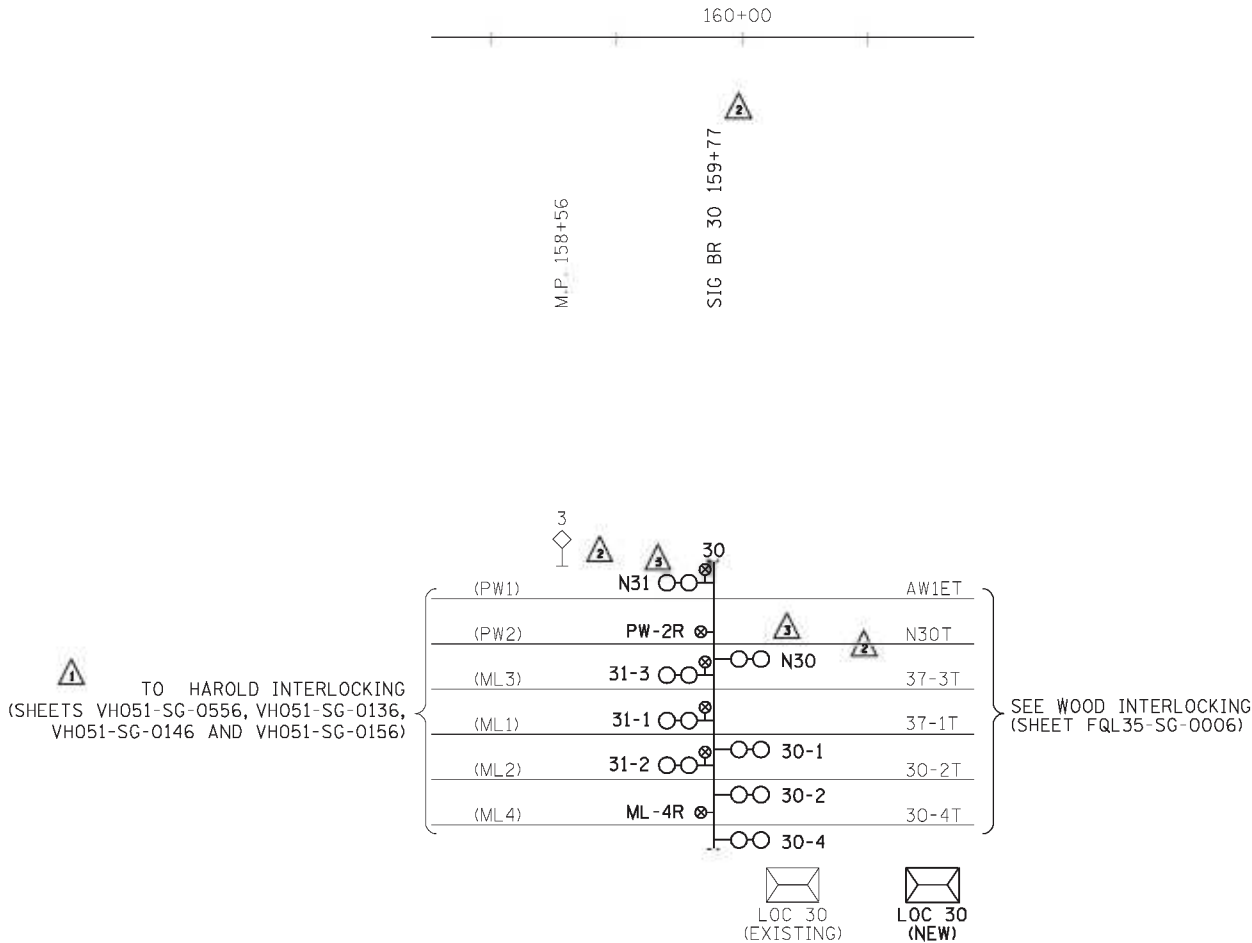
\$PRNAME\$

\$ (PLOTDRV)

12-12-06 PM

10/8/2015

\$REF63
c:\p\project\w\se\loc\loc\h\p\dms02756\p\vh051-sg-0138.dgn



- NOTES:
- 1. NEW COLOR LIGHT SIGNALS ON RELOCATED BRIDGE 30/31 ARE PLACED IN SERVICE AT STAGE 2G.
 - 2. ROUTE INDICATORS ON BRIDGE 30 ARE IN SERVICE WHEN ESA TUNNELS "A", "B/C" AND "D" ARE IN SERVICE.
 - 3. NEW TRACK CIRCUITS AND INTERFACE CIRCUITS TO WOOD INTERLOCKING ARE PLACED IN SERVICE IN CONCERT WITH HAROLD CIL CUTOVERS. THE ANTICIPATED SEQUENCE:
 - ML2, ML4, PW2 - H5/H6 INITIAL CUTOVER (STAGE 2G)
 - ML1, ML3, PW1 - H1/H2 CUTOVER (STAGE 2J)
 - 4. SIGNALS N31, 30-1, 31-1 AND 31-3 WILL BE TEMPORARY CONTROLLED OUT OF EXISTING LOC. 30 (THROUGH NEW LOCATION 30) UNTIL STAGE 2J.

LEGEND:

⊗ - ROUTE INDICATOR ON SIGNAL BRIDGE IN 410 TERRITORY (WITHOUT A SIGNAL).


REVISED DRAWING: AMPLIFYING

HORIZONTAL SCALE IN FEET

80' 40' 0 80' 160'

**Metropolitan Transportation Authority**
Capital Construction

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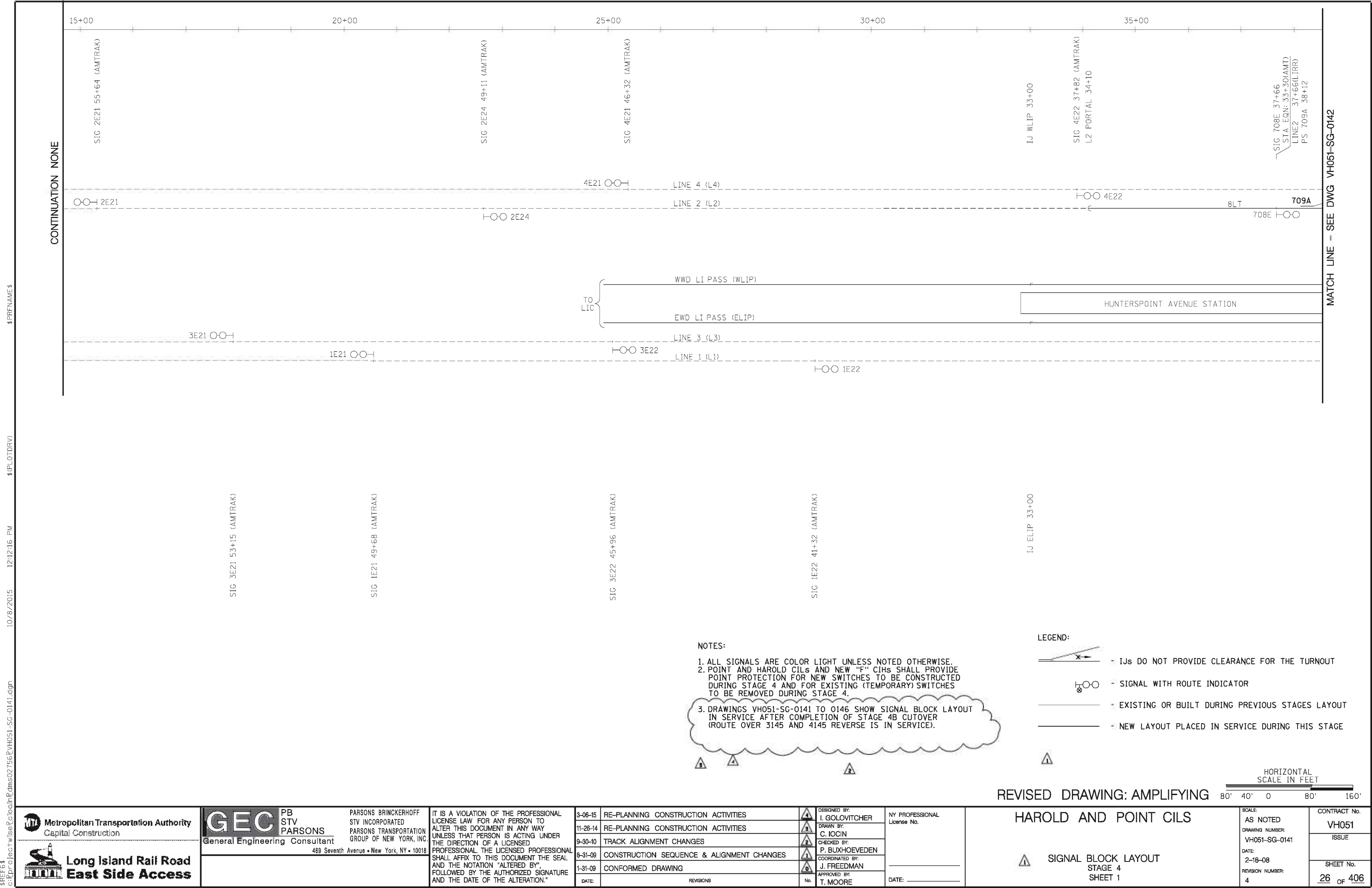
12-14-12	CUTOVER SEQUENCE REVISED	5
5-31-12	CUTOVER SEQUENCE REVISED	4
2-24-12	SIGNAL NAMES CORRECTION	3
6-30-10	TRACK ALIGNMENT CHANGES	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
1-31-09	CONFORMED DRAWING	0
DATE:	REVISIONS	No.

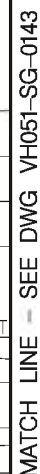
DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.
DRAWN BY: C. IOCIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	DATE: _____

 **HAROLD AND POINT CILS**

SIGNAL BLOCK LAYOUT – HAROLD TO WOOD
STAGE 3, 4 AND FINAL

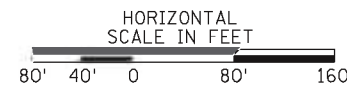
SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0138 DATE: 2-18-08 REVISION NUMBER: 5	CONTRACT No. VH051 ISSUE SHEET No. 25 OF 406
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NOTE:

1. SUB 4 WORK TO BE COMPLETED UNDER SEPARATE CONTRACT.



REVISÉ DRAUING: AMPLIFYING

HAROLD AND POINT CILS

 SIGNAL BLOCK LAYOUT
STAGE 4
SHEET 2

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0142
DATE:
2-18-08
REVISION NUMBER:
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CONTRACT No.
VH051
ISSUE
SHEET No.
27 OF 406



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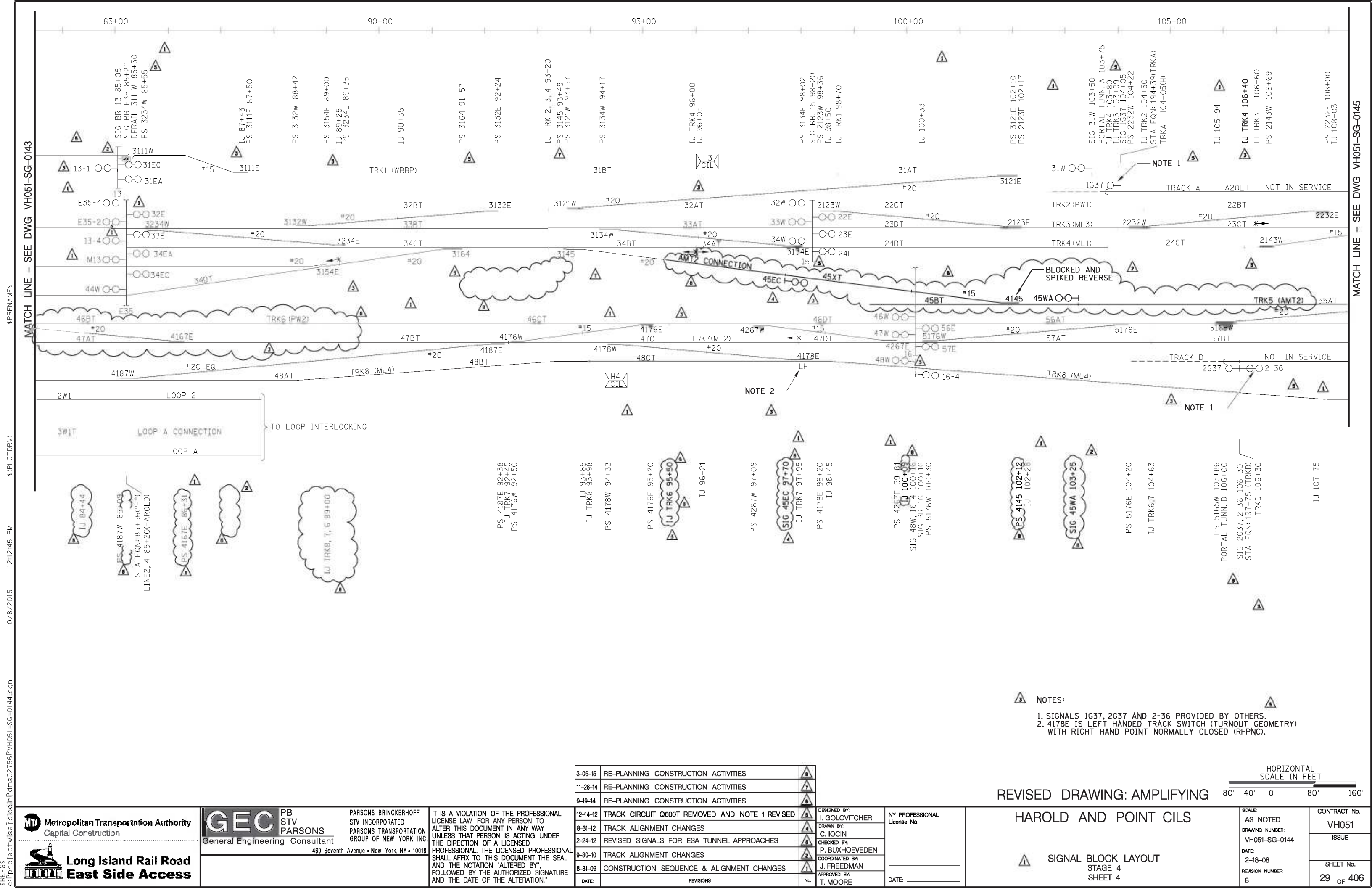
12-14-12	SIGNAL 822WC REVISED
2-24-12	F2 SIGNALS REVISED
9-30-10	TRACK ALIGNMENT CHANGES
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES
1-31-09	CONFORMED DRAWING
DATE:	REVISIONS

4	DESIGNED BY:	NY PROFESSIONAL License No. _____ DATE: _____
3	I. GOLOVITCHER	
2	DRAWN BY:	
1	C. IOCIN	
0	CHECKED BY:	
	P. BUXHOEVEDEN	
	COORDINATED BY:	
	J. FREEDMAN	
	APPROVED BY:	
	T. MOORE	

NY PROFESSIONAL
License No.

DATE: _____





10/8/2015 12:12:45 PM \$PLTDRV \$PRNAME\$

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3-06-15	RE-PLANNING CONSTRUCTION ACTIVITIES	
11-26-14	RE-PLANNING CONSTRUCTION ACTIVITIES	
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	
12-14-12	TRACK CIRCUIT Q600T REMOVED AND NOTE 1 REVISED	
8-31-12	TRACK ALIGNMENT CHANGES	
2-24-12	REVISED SIGNALS FOR ESA TUNNEL APPROACHES	
9-30-10	TRACK ALIGNMENT CHANGES	
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	
DATE:	REVISIONS	No.

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOCIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
T. MOORE

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DATE: _____

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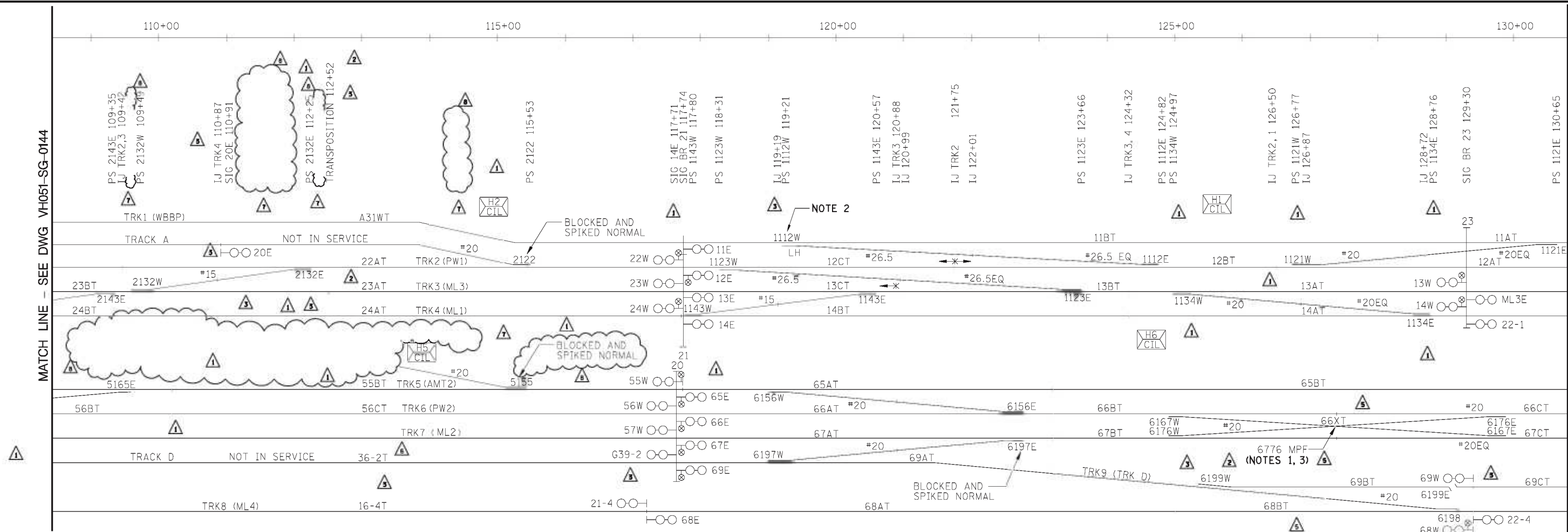
HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
STAGE 4
SHEET 4

SCALE: AS NOTED DRAWING NUMBER: VH051-SG-0144 DATE: 2-18-08 REVISION NUMBER: 8	CONTRACT No. VH051 ISSUE SHEET No. 29 OF 406
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- NOTES:
1. SIGNALS 1G37, 2G37 AND 2-36 PROVIDED BY OTHERS.
 2. 4178E IS LEFT HANDED TRACK SWITCH (TURNOUT GEOMETRY) WITH RIGHT HAND POINT NORMALLY CLOSED (RHPNC).





NOTES:


1. 6776 MPF IS SET NORMAL WHEN 6167 IS REVERSE. 6776 MPF SET REVERSE IF 6176 IS REVERSE.
2. I112W IS LEFT HANDED TRACK SWITCH (TURNOUT GEOMETRY) WITH RIGHT HAND POINT NORMALLY CLOSED (RHPNC).
3. TRACK CIRCUIT 66XT MUST BE UNOCCUPIED FOR ROUTES OVER SWITCH 6167 OR 6176 NORMAL.

HORIZONTAL
SCALE IN FEET



REVISÉ DRAWING: AMPLIFYING

HAROLD AND POINT CILS

 SIGNAL BLOCK LAYOUT
STAGE 4
SHEET 5

3-06-15	RE-PLANNING CONSTRUCTION ACTIVITIES	8
9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	6
6-14-13	TRACK CIRCUIT 2-36T REVISED	6
12-14-12	SWITCH CLEARANCE CONDITIONS ADDED	5
5-31-12	NOTE 2 CORRECTED	5
2-24-12	REVISED SIGNALS FOR ESA TUNNEL APPROACHES	5
9-30-10	TRACK ALIGNMENT CHANGES	2
8-31-08	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
DATE:	REVISIONS	No.

DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	P. BUXHOEVEDE
COORDINATED BY:	J. FREEDMAN
APPROVED BY:	T. MOORE

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DATE: _____



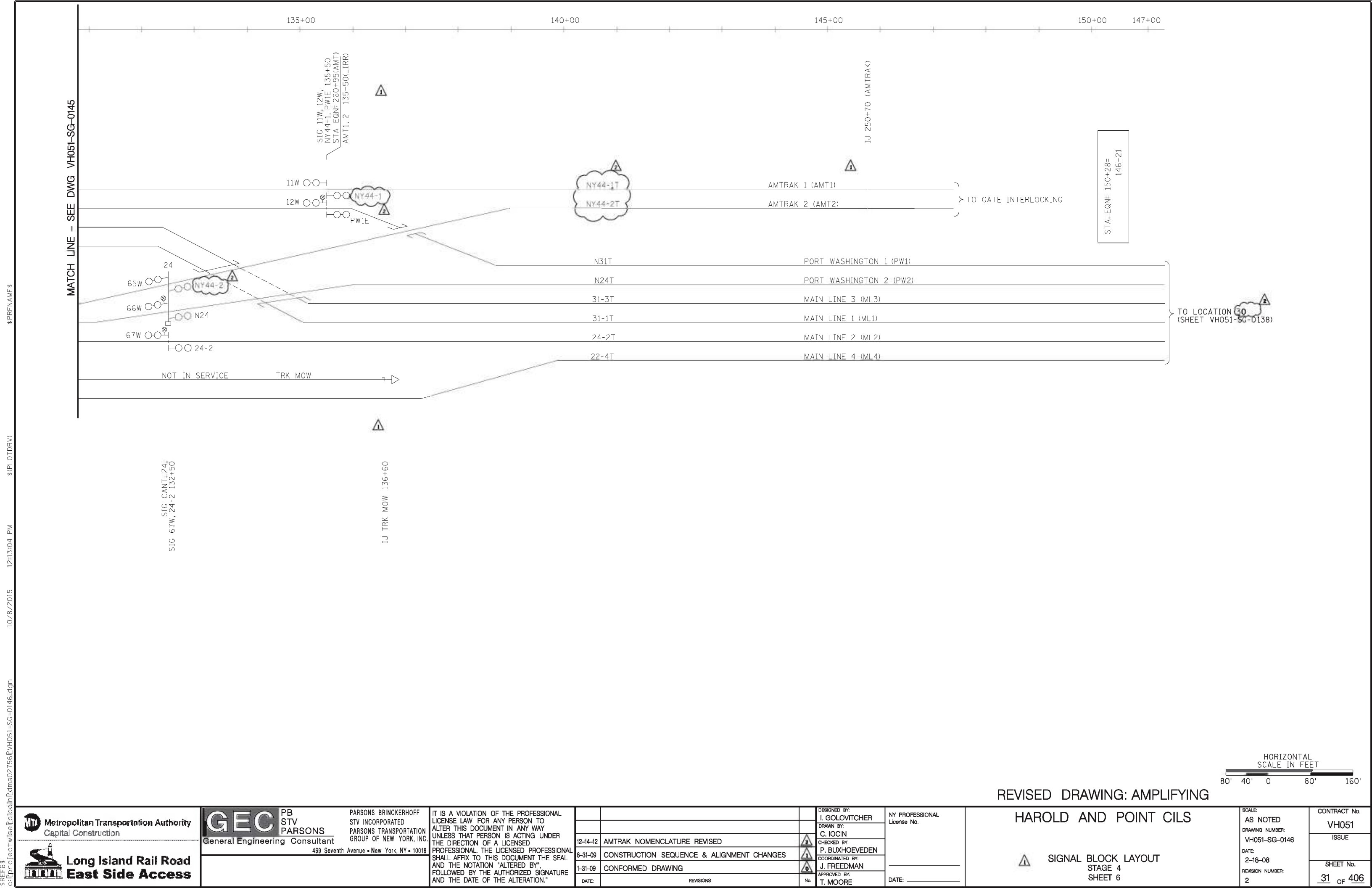
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MATCH LINE - SEE DWG VH051-SG-0146

MATCH LINE - SEE DWG VH051-SG-0144



\$PRNAME\$

\$PLOTDRV\$


12/13/04 PM

10/8/2015

\$REFG\$
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DATE	REVISIONS	No.
12-14-12	AMTRAK NOMENCLATURE REVISED	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
1-31-09	CONFORMED DRAWING	0

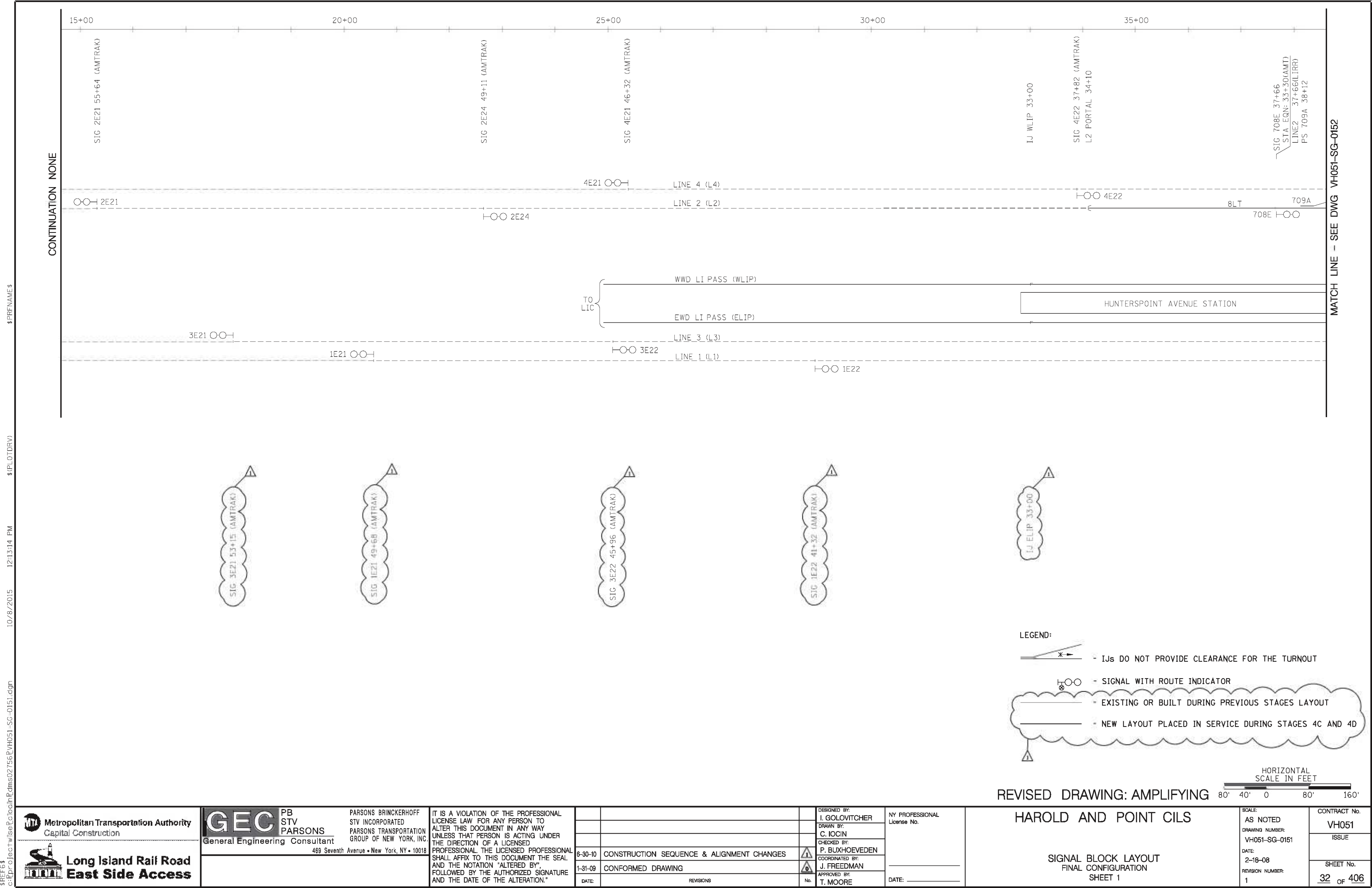
DESIGNED BY: I. GOLOVITCHER	NY PROFESSIONAL License No.
DRAWN BY: C. IOGIN	
CHECKED BY: P. BUXHOEVEDEN	
COORDINATED BY: J. FREEDMAN	
APPROVED BY: T. MOORE	DATE: _____

REVISED DRAWING: AMPLIFYING

 **SIGNAL BLOCK LAYOUT**
STAGE 4
SHEET 6

HAROLD AND POINT CILS

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0146	ISSUE
DATE: 2-18-08	SHEET No.
REVISION NUMBER: 2	31 OF 406




CONTINUATION NONE

MATCH LINE - SEE DWG VH051-SG-0152

LEGEND:

 - IJs DO NOT PROVIDE CLEARANCE FOR THE TURNOUT

 - SIGNAL WITH ROUTE INDICATOR

 - EXISTING OR BUILT DURING PREVIOUS STAGES LAYOUT

 - NEW LAYOUT PLACED IN SERVICE DURING STAGES 4C AND 4D

HORIZONTAL
SCALE IN FEET

REVISED DRAWING: AMPLIFYING

80' 40' 0 80' 160'



 Metropolitan Transportation Authority
Capital Construction

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FOLLOWED BY THE AUTHORIZED SIGNATURE
AND THE DATE OF THE ALTERATION."

DATE	REVISIONS	No.
6-30-10	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	
1-31-09	CONFORMED DRAWING	

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOCIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
T. MOORE

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License No.

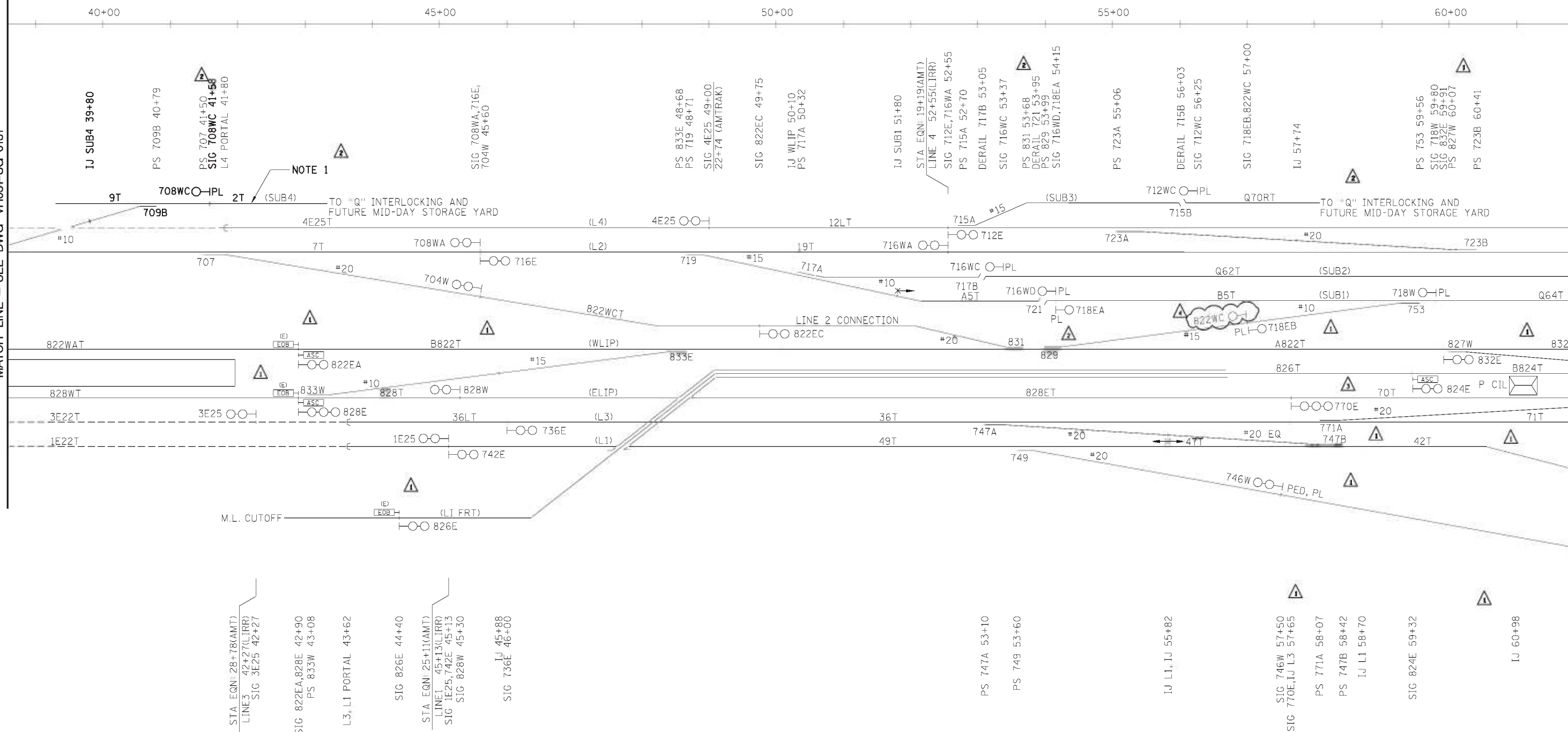
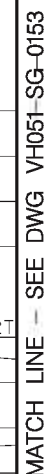
DATE: _____

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
FINAL CONFIGURATION
SHEET 1

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0151
DATE:
2-18-08
REVISION NUMBER:
1

CONTRACT No.
VH051
ISSUE
SHEET No.
32 OF 406



2

NOTE:

1. SIGNAL WORK FOR ACCESS TO NEW MID-DAY STORAGE YARD TO BE COMPLETED UNDER SEPARATE CONTRACT.

HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

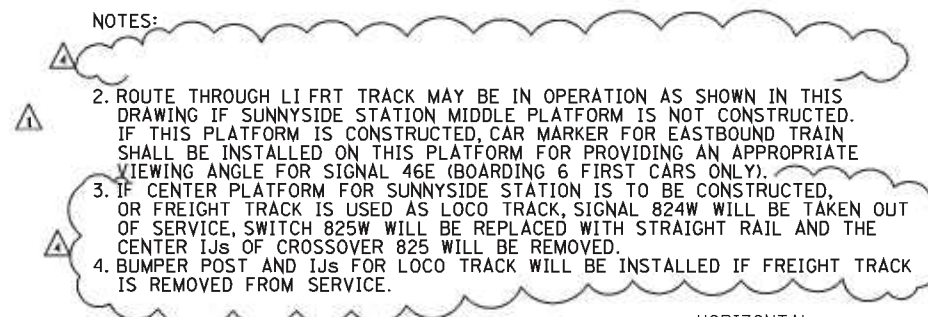
REVISÉ DRAUING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
FINAL CONFIGURATION
SHEET 2

SCALE:
AS NOTED
DRAWING NUMBER:
VH051-SG-0152
DATE:
2-18-08
REVISION NUMBER:
4

CONTRACT No.
VH051
ISSUE
SHEET No.
33 OF 406







REVISÉ DRAUING: AMPLIFYING

SIGNAL BLOCK LAYOUT
FINAL CONFIGURATION
SHEET 3

SCALE: AS NOTED	CONTRACT No. VH051
DRAWING NUMBER: VH051-SG-0153	ISSUE
DATE: 2-18-08	SHEET No. 34 of 40
REVISION NUMBER: 4	

9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES
2-24-12	REVISED ROUTE INDICATORS
6-30-10	TRACK ALIGNMENT CHANGES
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES
DATE	REVISIONS

	DESIGNED BY: I. GOLOVITCHER
	DRAWN BY: C. IOCIN
	CHECKED BY: P. BUXHOEVEDEN
	COORDINATED BY: J. FREEDMAN
	APPROVED BY: T. MCCOBB
No.	

\$PRNAME\$

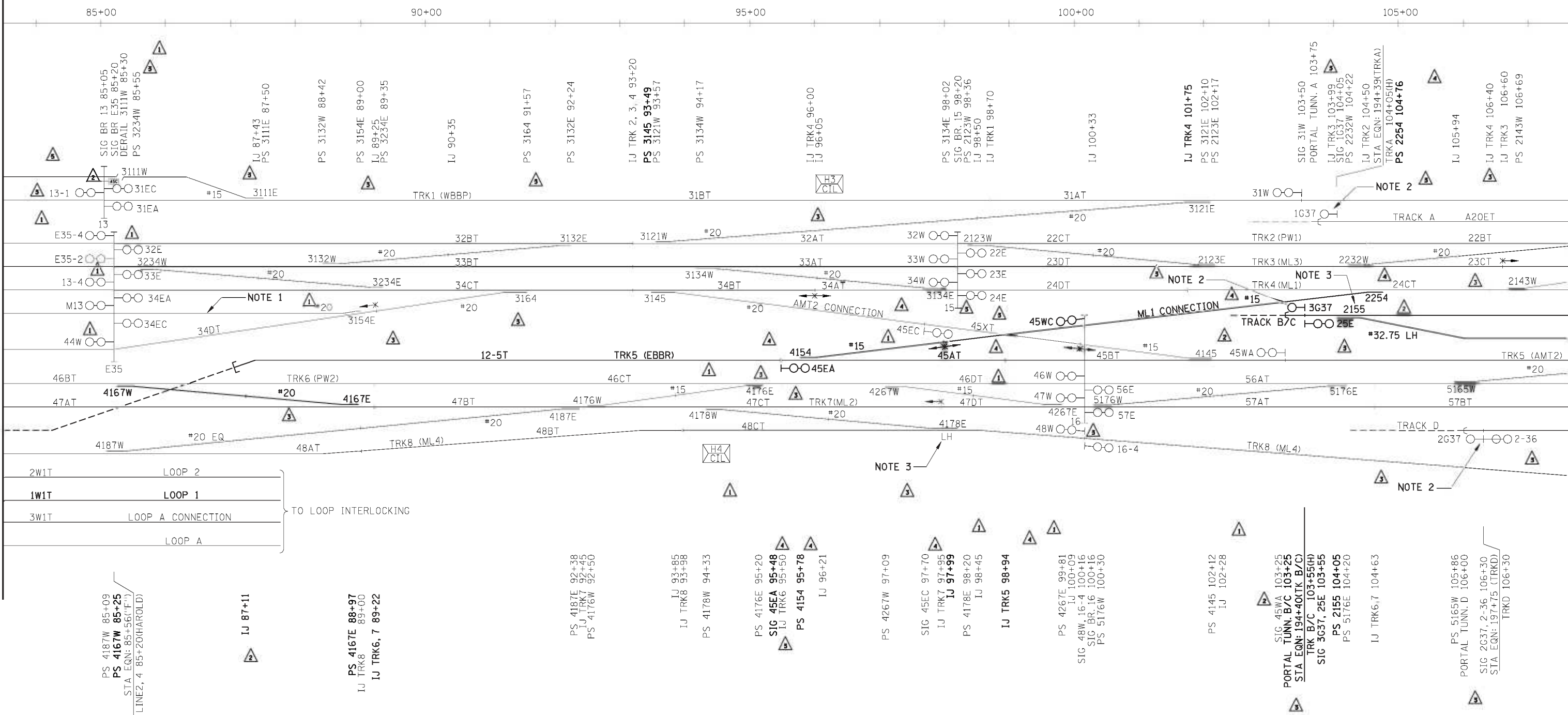
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MATCH LINE - SEE DWG VH051-SG-0153

MATCH LINE - SEE DWG VH051-SG-0155



NOTES:

1. IF CENTER PLATFORM FOR SUNNYSIDE STATION IS TO BE CONSTRUCTED OR FRT TRACK IS USED AS LOCO TRACK, SIGNAL M13 WILL BE TAKEN OUT OF SERVICE, TRACK CIRCUIT M13T WILL BE CUT SHORT, DERAIL 3154W WILL BE INSTALLED WEST OF BRIDGE E35 AND SIGNAL 34EC WILL BE RELOCATED WEST OF THE DERAIL AS STACKED COLOR LIGHT SIGNAL.
2. SIGNALS 1G37, 2G37, 3G37, 2-36 AND 25E PROVIDED BY OTHERS.
3. 4178E AND 2155 ARE LEFT HANDED TRACK SWITCHES (TURNOUT GEOMETRY) WITH RIGHT HAND POINT NORMALLY CLOSED (RHPNC).

REVISED DRAWING: AMPLIFYING

HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
FINAL CONFIGURATION
SHEET 4

Metropolitan Transportation Authority
Capital Construction

Long Island Rail Road
East Side Access

GEC PB
STV
PARSONS
General Engineering Consultant

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9-19-14	RE-PLANNING CONSTRUCTION ACTIVITIES	
12-14-12	TRACK CIRCUIT Q600T REMOVED AND NOTE 2 REVISED	
8-31-12	TRACK ALIGNMENT CHANGES	
2-24-12	REVISED SIGNALS FOR ESA TUNNEL APPROACHES	
6-30-10	TRACK ALIGNMENT CHANGES	
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	
DATE:	REVISIONS	No.

DESIGNED BY:
I. GOLOVITCHER
DRAWN BY:
C. IOGIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
T. MOORE

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SCALE:
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DATE:
2-18-08
REVISION NUMBER:
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CONTRACT No.
VH051
ISSUE
SHEET No.
35 OF 406



SIG 25WC 111+55

PS 5155 115+43

SIG 21-4.68E 117+20
SIG BR 20 117+64
SIG 55W 117+73

PS 6156W, 6197W 118+98

IJ 120+90

SS 6156E, 6197E 122+80
JJ TRK5, 6, 7, D 123+20

PS 6167W, 6176W 124+90
IJ TRK8 125+00
PS 6199W 125+34

IJ 126+60

IJ 127+23
IJ TRK6, 7 127+38

IJ 128+17

DERAIL 6199E 129+00
PS 6198 129+20
SIG 22-4, 68W, 69W 129+40
PS 6167E, 6176E 129+88

7E,6176E 129+88

1. 6776 MPF IS SET NORMAL WHEN 6167 IS REVERSE. 6776 MPF SET REVERSE IF 6176 IS REVERSE.
2. 1112W IS LEFT HANDED TRACK SWITCH (TURNOUT GEOMETRY) WITH RIGHT HAND POINT NORMALLY CLOSED (RHPNC).
3. TRACK CIRCUIT 66XT MUST BE UNOCCUPIED FOR ROUTES OVER SWITCH 6167 OR 6176 NORMAL.

HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

6-14-13	TRACK CIRCUIT 2-36T REVISED	6
12-14-12	SWITCH CLEARANCE CONDITIONS ADDED	5
5-31-12	NOTE 2 CORRECTED	4
2-24-12	REVISED SIGNALS FOR ESA TUNNEL APPROACHES	3
6-30-10	TRACK ALIGNMENT CHANGES	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
1-31-09	CONFORMED DRAWING	0
DATE:	REVISIONS	No.

DESIGNED BY:	I. GOLOVITCHER
DRAWN BY:	C. IOCIN
CHECKED BY:	P. BUXHOEVEDE
COORDINATED BY:	J. FREEDMAN
APPROVED BY:	T. MOORE

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HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
FINAL CONFIGURATION
SHEET 5

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DATE:
2-18-08
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\$PRNAME\$

\$(PLOTDRV)

12:14:00 PM

10/8/2015

\$REF63
c:\p\project\w\se\p\tools\p\dms02756\p\vh051-sg-0156.dgn

MATCH LINE - SEE DWG VH051-SG-0155

135+00

140+00

145+00

150+00

147+00

SIG 11W, 12W,
NY44-1, PW1E, 135+50
STA. EQN: 260+95(AMT)
AMT1, 2 135+50(LIRR)

11W
12W

NY44-1

PW1E

NY44-1T
NY44-2T

AMTRAK 1 (AMT1)

AMTRAK 2 (AMT2)

TO GATE INTERLOCKING

IJ 250+70 (AMTRAK)

STA. EQN: 150+28=
146+21

65W
66W
67W

24

NY44-2

N24

24-2

TRK MOW

N31T

PORT WASHINGTON 1 (PW1)

N24T

PORT WASHINGTON 2 (PW2)

31-3T

MAIN LINE 3 (ML3)

31-1T

MAIN LINE 1 (ML1)

24-2T

MAIN LINE 2 (ML2)

22-4T

MAIN LINE 4 (ML4)

TO LOCATION 30
(SHEET VH051-SG-0138)

SIG CANT. 24,
SIG 67W, 24-2 132+50

IJ TRK MOW 136+60

HORIZONTAL
SCALE IN FEET

80' 40' 0 80' 160'

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12-14-12	AMTRAK NOMENCLATURE REVISED	2
8-31-09	CONSTRUCTION SEQUENCE & ALIGNMENT CHANGES	1
1-31-09	CONFORMED DRAWING	0

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DRAWN BY:
C. IOGIN
CHECKED BY:
P. BUXHOEVEDEN
COORDINATED BY:
J. FREEDMAN
APPROVED BY:
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HAROLD AND POINT CILS

SIGNAL BLOCK LAYOUT
FINAL CONFIGURATION
SHEET 6

SCALE:
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VH051-SG-0156
DATE:
2-18-08
REVISION NUMBER:
2

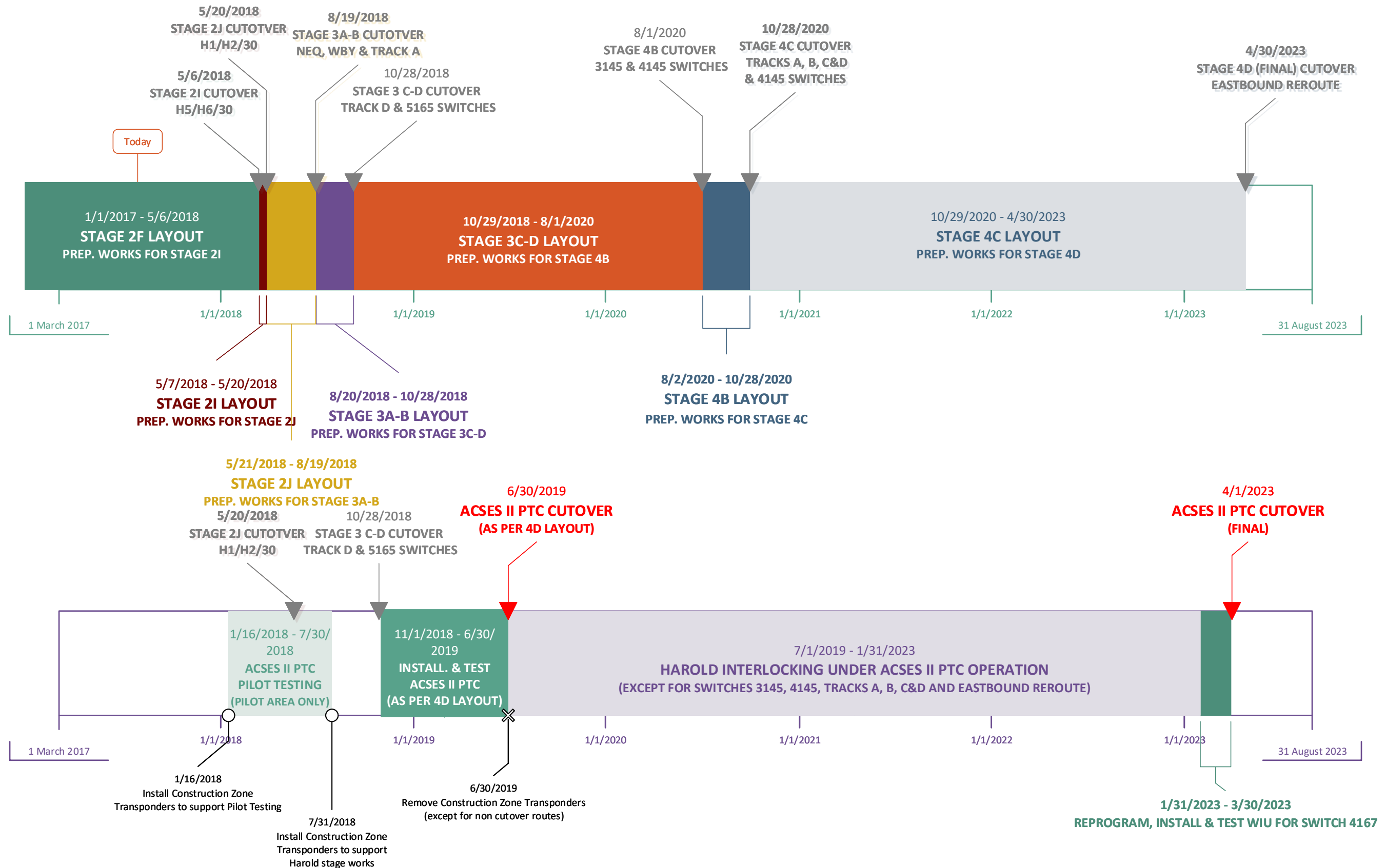
CONTRACT No.
VH051
ISSUE
SHEET No.
37 OF 406

Attachment B

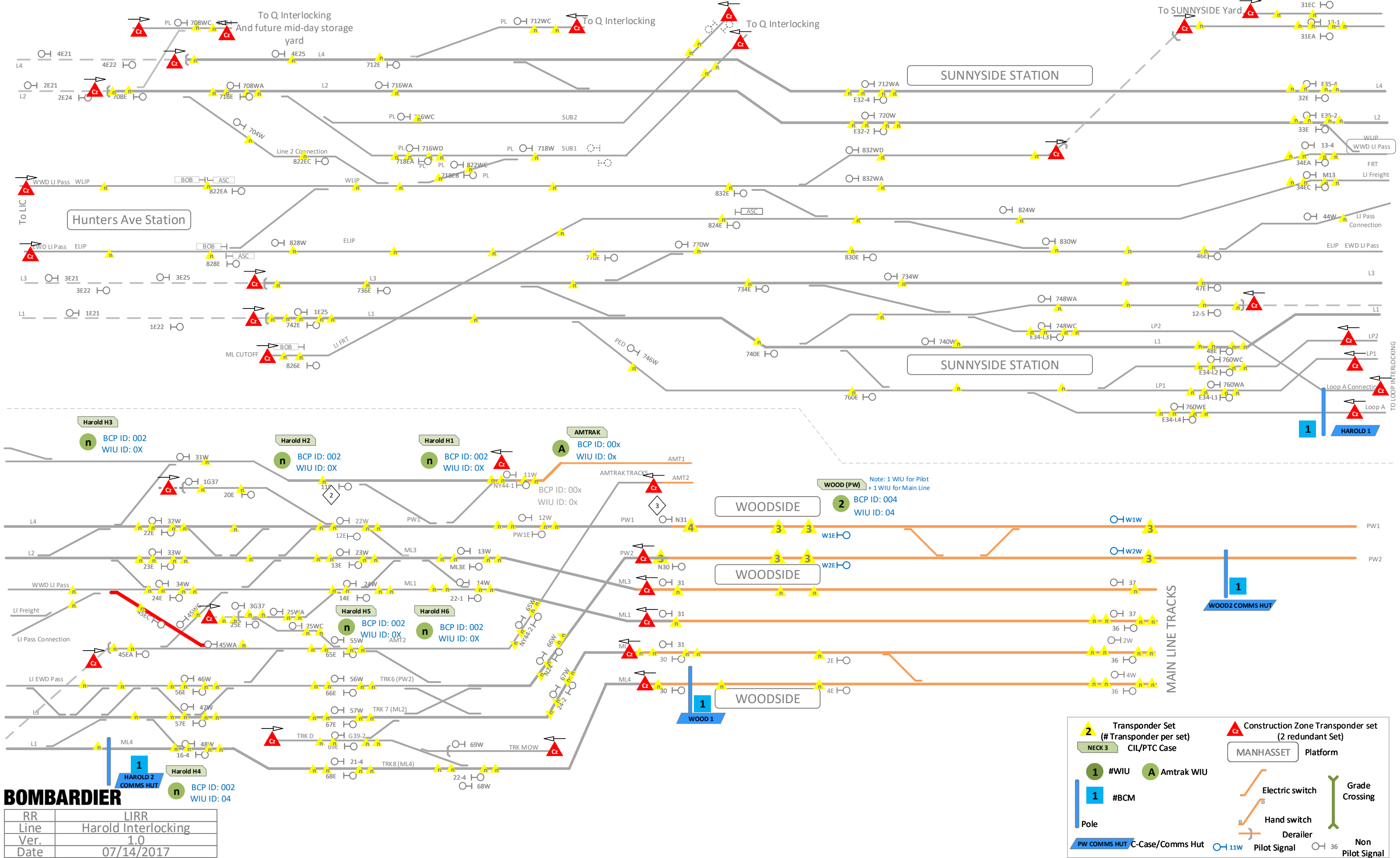
(LIRR Harold Staging Rev 1.0)

LIRR HAROLD

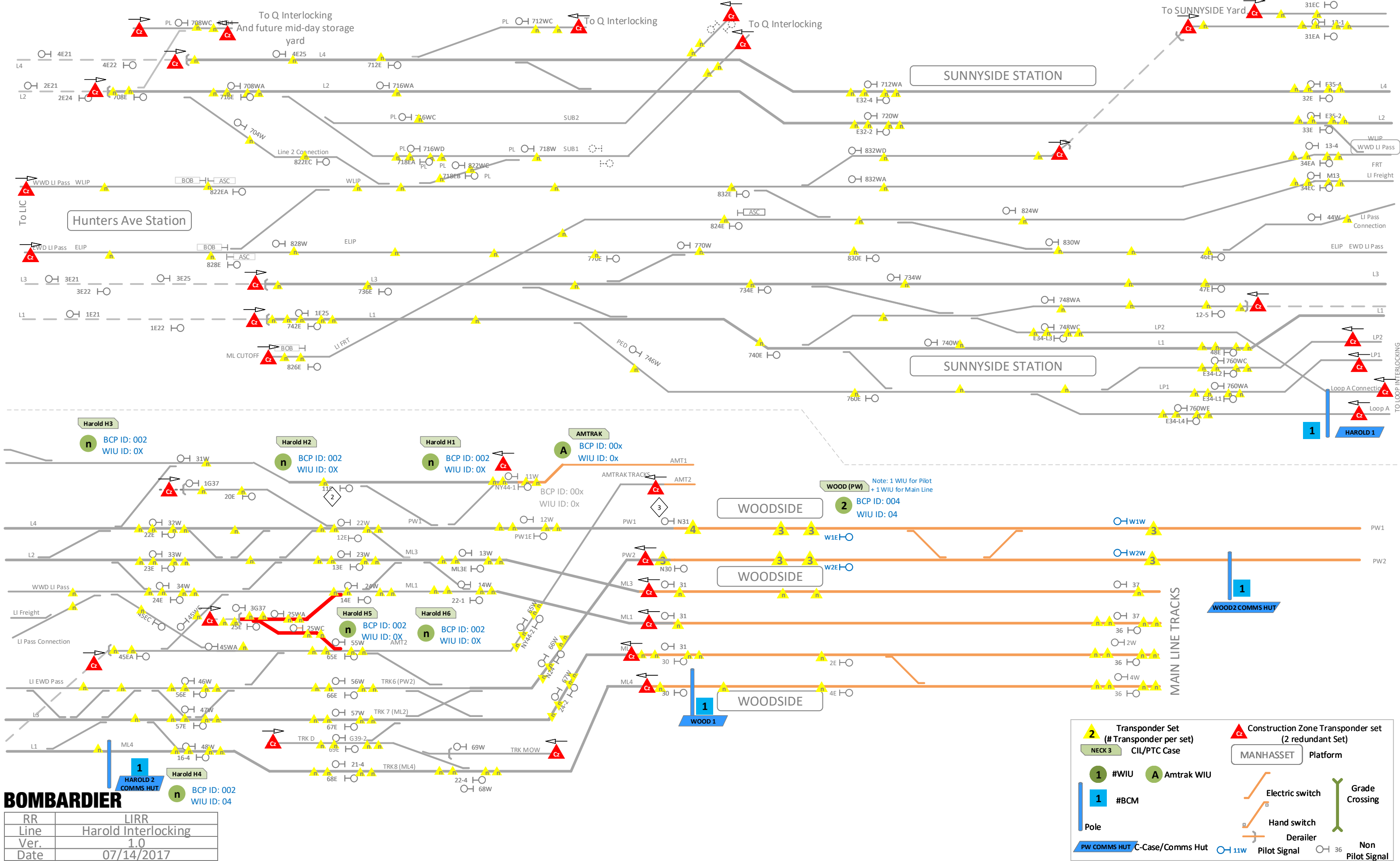
High level stages, cutover and ACSES II implementation schedule.



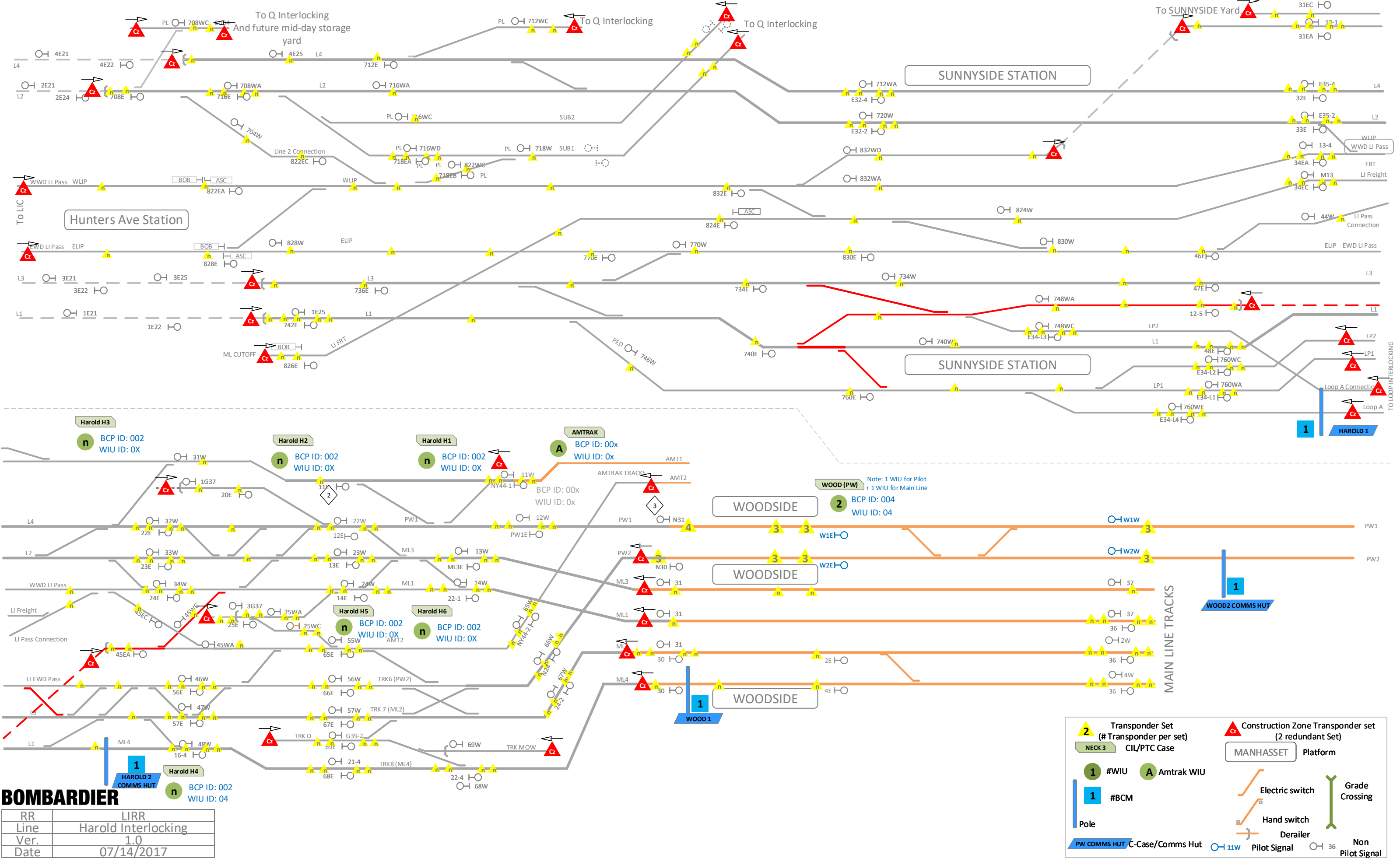
RR #	436
Line #	087



RR #	436
Line #	087



RR #	436
Line #	087



RR	LIRR
Line	Harold Interlocking
Ver.	1.0
Date	07/14/2017

2

Transponder Set
(# Transponder per set)

NECK 3

CIL/PTC Case

1

#WIU

1

#BCM

Pole

PW COMMS HUT

C-Case/Comms Hut

1

Amtrak WIU

A

Amtrak WIU

Construction Zone Transponder set
(2 redundant Set)

MANHASSET Platform

Electric switch

Hand switch

Derailer

Pilot Signal

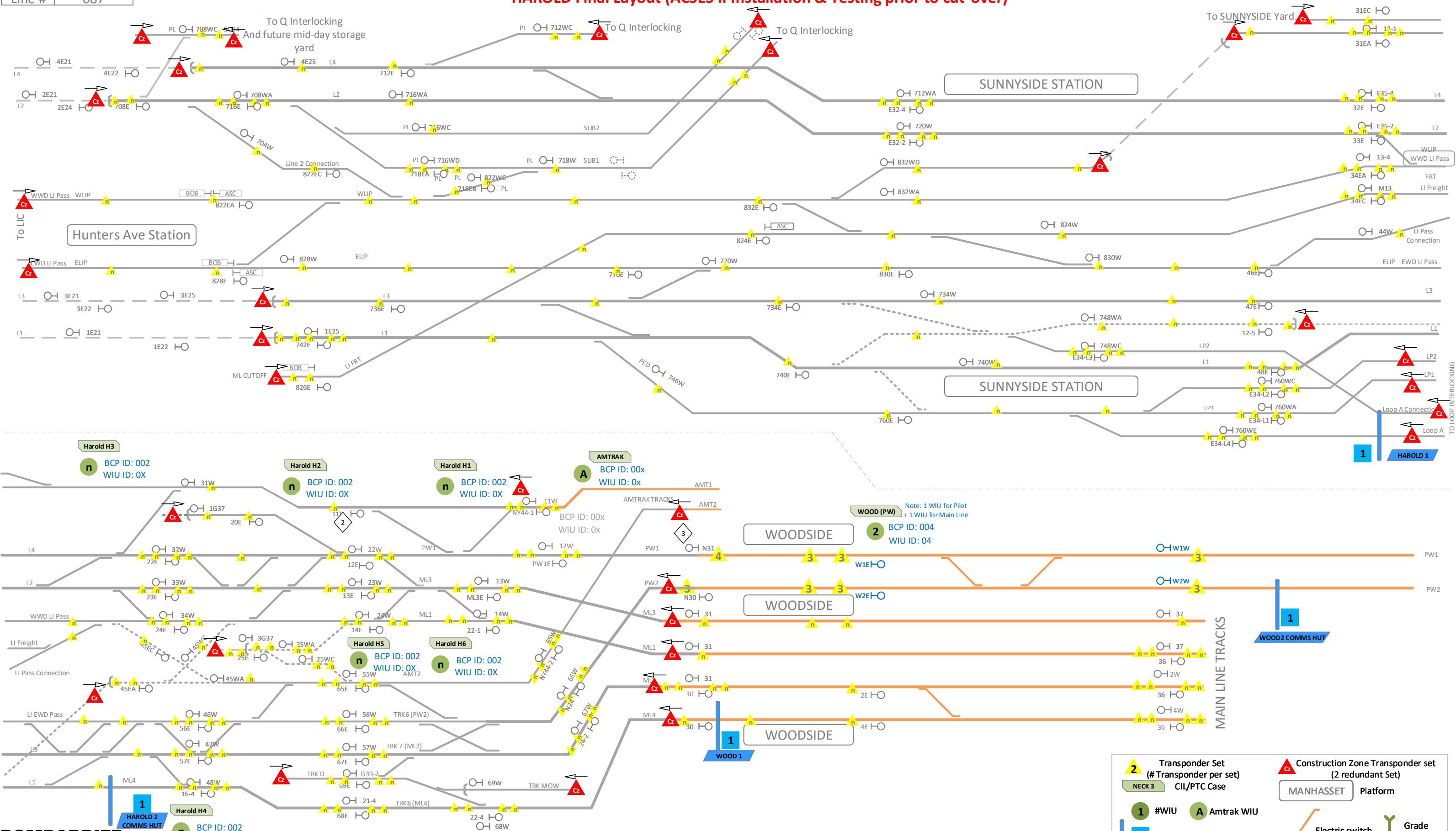
Grade Crossing

Non Pilot Signal

BOMBARDIER

RR #	436
Line #	087

HAROLD Final Layout (ACES II Installation & Testing prior to cut-over)



RR	LIRR
Line	Harold Interlocking
Ver.	1.0
Date	07/14/2017

2

Transponder Set
(# Transponder per set)
NECK 3

CIL/PTC Case

1

#WIU

A

Amtrak WIU

1

#BCM

1

Pole

PW COMMS HUT

C-Case/Comms Hut

Construction Zone Transponder set
(2 redundant Set)

MANHASSET

Platform

Electric switch

Hand switch

Derailer

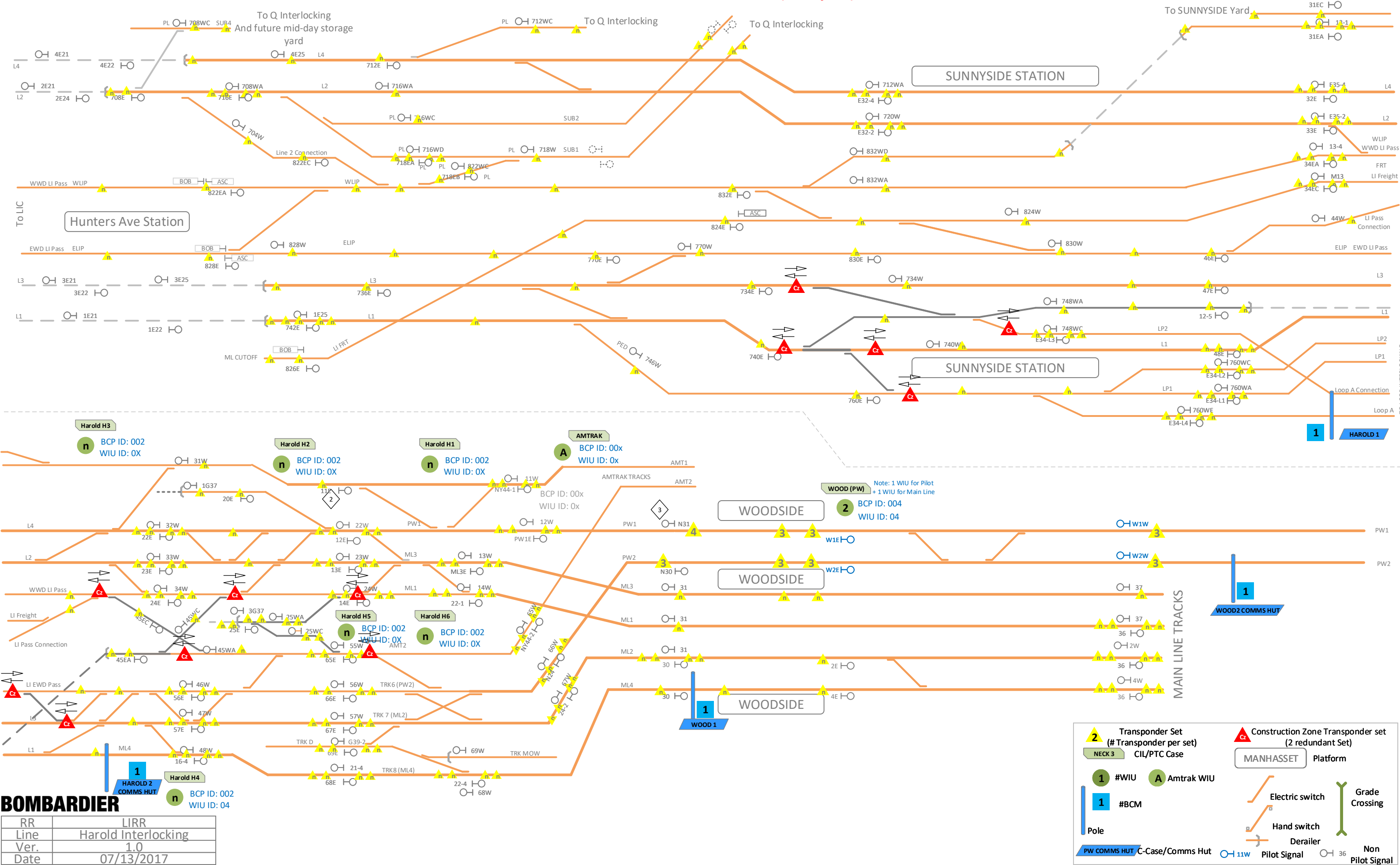
Pilot Signal

Grade Crossing

Non Pilot Signal

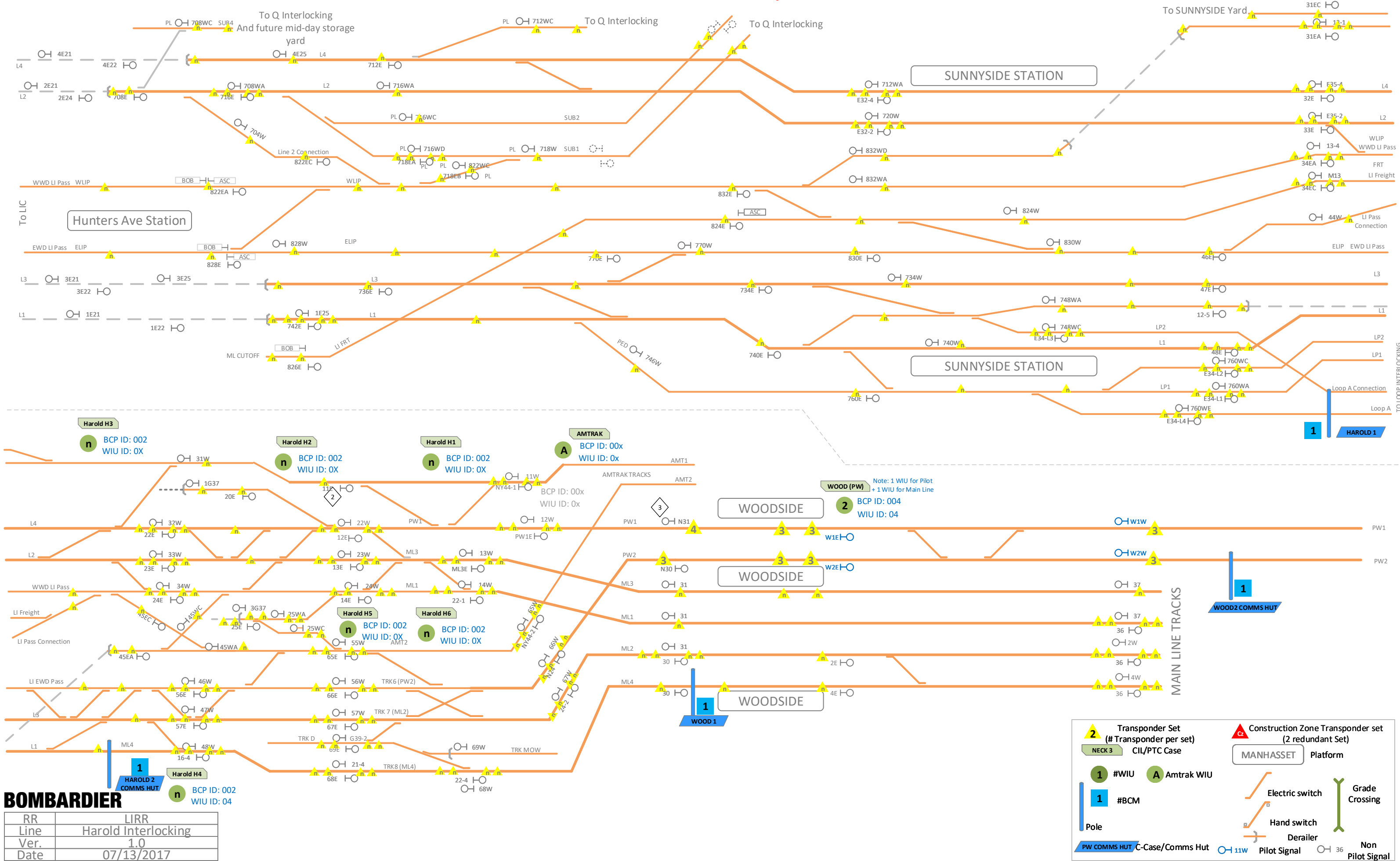
RR #	436
Line #	087

HAROLD Initial Cut-over (4D layout)



RR #	436
Line #	087

HAROLD Final Layout





December 22, 2017

Mr. Robert C. Lauby, P.E.,
Associate Administrator for Railroad Safety & Chief Safety Officer
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC, 20590

Re: Long Island Rail Road Test Waiver Request Revision A
East Side Access Harold Interlocking

Dear Mr. Lauby, P.E.,

Attached for your review and approval is a revision to the PTC Test Waiver for the ESA Harold Interlocking area originally submitted on October 6, 2017. This revision is based upon a field survey that was conducted on Friday, October 20, 2017 between the FRA, LIRR and the PTC Systems Integrator.

Long Island Rail Road (LIRR) is in the process of installing the ACSES II system as an overlay to existing signaling systems for its compliance with the Positive Train Control (PTC) regulations of 49 CFR, Part 236, Subpart I. LIRR contracted with a System Integrator (SI) in late 2013 to design, furnish, install, integrate, and commission ACSES II throughout the railroad's mainline trackage.

In addition to the system-wide PTC deployment, LIRR has undertaken the East Side Access (ESA) project as a major system expansion, constructing a new connection between Grand Central Terminal (GCT) in midtown Manhattan and LIRR's major interlocking complex in Queens, NY known as "Harold Interlocking". Harold is a very large interlocking complex with many hundreds of trains operating through it everyday including both LIRR trains and Amtrak trains. The interlocking is undergoing major track and signal system changes via a multitude of reconfigurations in order to create the connection to GCT. The reconfiguration is being accomplished while maintaining LIRR's high density train movements through the area.

The Harold Interlocking reconfiguration under traffic is very challenging, requiring major shifts in the physical infrastructure and new interlocking signaling. Many stages are required to implement the reconfiguration. The current ESA project schedule will not achieve a stable configuration for the existing train movements through the interlocking until the end of October 2018. Due to the staging complexity and late 2018 scheduled completion for existing routes through the interlocking complex, the LIRR is requesting a waiver from the PTC regulation requirements to be commissioned by December 31, 2018.

The multi-staging of the Harold reconfiguration represents a significant challenge and inherent risk associated with changing, testing, commissioning the safety-critical topographic databases and transponder placements of ACSES II at Harold. The proposed waiver is to exclude the installation of ACSES II transponders and associated database implementations and testing until the new routes supporting existing train movements through Harold are completed. Upon completion of the stage in which existing service operates, LIRR proposes to install, test, and enter in to Revenue Service

Demonstration (RSD) ACSES II capabilities on the active Harold routes as soon as possible. The remaining routes at Harold that have not been completed at that time would be commissioned fully compliant with PTC regulations as they are completed and readied for service.

Throughout the Harold staging, today and to completion, LIRR's 49 CFR Part 236, Subpart A through H compliant cab signaling with continuous Automatic Train Control would govern train movements on all main line routes. Details of the proposed Harold PTC implementation are outlined in the attached.

Should you have any questions, please contact me at 718-558-3538.

Sincerely,



Deborah Chin, P.E.
Executive Director - PTC
MTA Long Island Rail Road

CC: A. Arenth, LIRR
L. Warren, FRA

A. Hezarkhani, LIRR
D. Blackmore, FRA

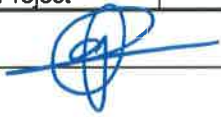


N. Forshner, MTA CC

Attachment: Harold Interlocking Test Waiver Request - LIRR - 3051476 Rev__A.pdf

Metropolitan Transportation Authority
Long Island Rail Road
PTC – SYSTEM INTEGRATION
Bombardier Siemens PTC Project Consortium
Contract Numbers: 1712

LIRR Harold Interlocking Installation Waiver Request

Responsible Division:	Responsible Unit:	Document Type:	Distribution Status:	Document State:
BT-SRA	PM	Report	Project	Released

Prepared:	Daniel Laguna System Integrator		12/21/2017
Verified:	Rick Galloway System Integrator		2017.12.22 10:36:57 -05'00'
Approved:	Anthony DeFrancisco Project Director		12/21/17
SI Quality Process Review:	Bon Provenzano BT Quality Assurance Group		2017-12-21
BT/SRA Review:	NA Title		
BT/SRA Review:	NA Title		

Name / Title, Group	Signature	Date
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Nothing herein shall limit the rights of the Railroads under Article 404 of Contract Nos. 1712/29544.</p> <p>© 2017, Bombardier Inc. or its subsidiaries.</p> <p>Copyright © 2017 Siemens Industry, Inc.</p> </div> <div style="width: 50%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Reference Document #:</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Identity Number: <div style="text-align: center; font-size: 1.2em; font-weight: bold;">3051476</div></div> <div style="display: flex; justify-content: space-between; font-size: 0.8em;"> <div>Effective Date: 2017-12-21</div> <div>Revision: _A</div> <div>Language: EN</div> </div> </div> </div>		

Revision Log

Revision	Date (yyyy-mm-dd)	Description of Changes
	2017-09-20	Initial version
_A	2017-12-21	Update after FRA comments

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1 Executive Summary

Long Island Rail Road's (LIRR) currently terminates and originates service in midtown Manhattan, New York only at Penn Station. LIRR's East Side Access (ESA) project provides a new branch line to Grand Central Terminal (GCT) in Manhattan via the 63rd Street Tunnel. The new line to GCT merges with LIRR's Main Line in Queens, NY at LIRR's "Harold" interlocking. As part of ESA, "Harold" is being significantly reconfigured and re-signaled. The "Harold" reconfiguration includes many stages. The "Harold" reconfiguration is scheduled to be substantially completed by the end of 2018.

Concurrently with the ESA project work, LIRR is deploying ACSES system throughout its territory to provide the additional functionality to its existing signaling required to comply with Part 239, Subpart I. Supporting multiple track and signal reconfigurations and staging at "Harold" with new ACSES transponders and Office system database changes would be extremely challenging. Accordingly, LIRR is requesting a waiver that permits its ACSES system to not be implemented for "Harold" routes until the ESA staging is physically complete.

This waiver request, if granted by FRA will allow MTA to complete the necessary Harold Reconfiguration works with the ESA Project, and the testing of the ACSES II PTC system. The PTCIP will be updated to incorporate the new schedule and roll-out of the Harold interlocking. An update to the PTCSP will be submitted to FRA once the planned works and tests have been completed and the Harold/ESA is ready for commissioning.

2 Introduction

Pursuant to 49 Code of Federal Regulations (CFR) §236.1035, the Long Island Railroad (LIRR) submits the following Waiver request to support the planned Civil Works and Signaling works on the MTA ESA Project.

The Harold Interlocking territory is undergoing a complete redesign of the track layout and the Signaling system controlling this area. These works comprise the addition and removal of switches, signals and track circuits as well as the addition, removal and reconfiguration of tracks.

The works are divided into multiple stages. A total of 4 main stages, each with sub-stages are planned from the issuance of this waiver request till the completion of the works planned for April 2023.

The number of stages required for completing the works plus the necessary reconfigurations expected for each of them makes extremely complicated the Installation, Testing and Commissioning of the ACSES II PTC system. Due to the track reconfiguration, the Transponder design and layout would need to be changed for every stage increasing the Safety related risks associated with continuous modifications of the vital system. Likewise, the WIU units will require numerous reprogramming to match the new or modified tracks, switches and signals. It will also require the functional operation testing of the Amtrak ACSES II PTC System and the LIRR ACSES II PTC System entering and exiting Harold Interlocking.

To eliminate the possible hazards derived from the staged implementation of the ESA Project Harold reconfiguration, LIRR is requesting a waiver to exclude the Harold Interlocking territory from the PTCIP and PTCSP until the planned works are completed in this territory. An updated PTCIP describing the sequence of activities and the planned schedule will be submitted to FRA. The PTCSP will be updated in line with the planned roll-out stages.

All existing routes will be fully equipped with ACSES II equipment including Transponders, WIU and Wayside Communications equipment by December 2018, however due to the cutover works, the ACSES II system on these might not be put in revenue service until a later date to make it coincident with the actual route cutover. Any route introduced after December 2020 will be cutover along with the ACSES II system.

This document describes the installation, testing and commissioning strategy as well as the high-level schedule planned to ensure the proper introduction of the ACSES II PTC system in the Harold Interlocking territory.

2.1 Reference Documents

Table 1: Reference Documents

Reference Number	Document Name	Identification Number	Revision
[1]	Dictionary of Terms and Acronyms	3035624	_A
[2]	LIRR PTCIP	NA	3.0 (Jan 26, 2016)
[3]	LIRR PTCDP	NA	5.3
[4]	49 CFR §236 – All Subparts A – I	NA	NA
[5]	49 CFR §216, §217, §229, and §240	NA	NA
[6]	System Description Document (CDRL 2-027)	3035724	_G
[7]	LIRR System Architecture Description	3038633	_A
[8]	LIRR FRA Test Waiver Request	3045791	_C
[9]	Signed conditional approval LIRR test waiver request	RRS-1820005	N/A
[10]	LIRR Pilot Program Plan (CDRL 2-019)	3035622	_B

3 High level Schedule

The following diagram shows the high-level timeline planned for the reconfiguration of the Harold interlockings. This schedule is limited to the Civil Works and non-PTC signaling works.

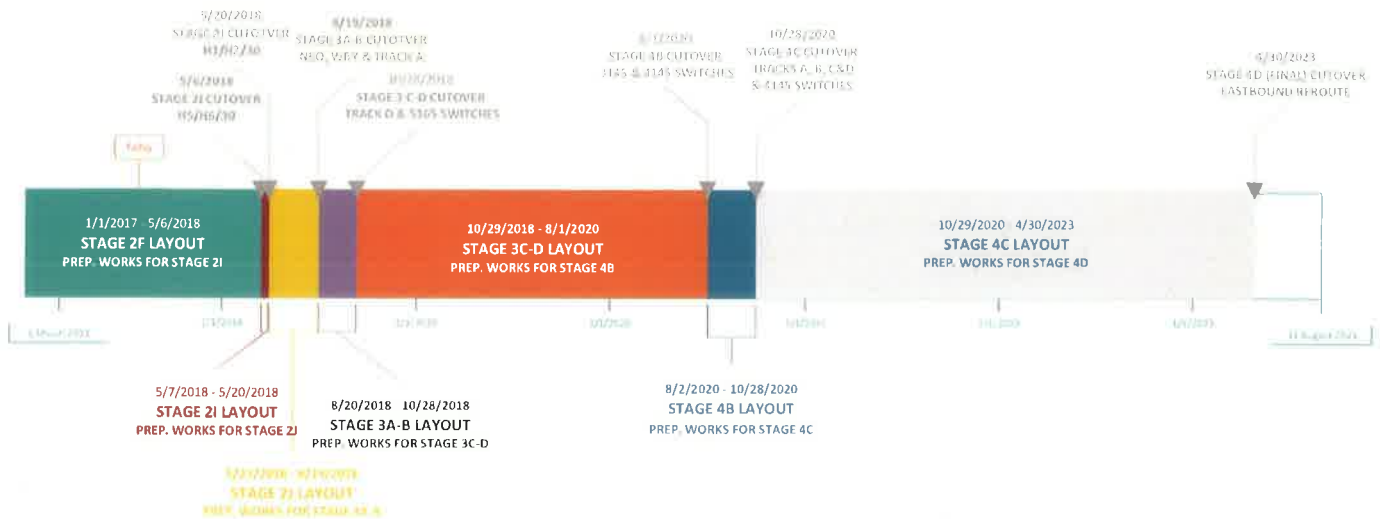


Figure 1 Harold Staging High Level Timeline

As shown in the planned timeline, the main stage cutover target dates are:

- Stage 2F: Current layout.
- Stage 2I Cutover: May 2018
- Stage 2J Cutover: May 2018
- Stage 3A&B Cutover: August 2018
- Stage 3C&D Cutover: October 2018
- Stage 4B Cutover: August 2020
- Stage 4C Cutover: October 2020
- Stage 4D Cutover: April 2023

The major changes in terms of track layout happen between stages 2F and 2J as well as between stages 2J and 3C&D, for this reason, the ACSES II PTC system will not be installed until a stable track layout is cutover in order to avoid Transponders, WIU and potentially Radio reinstallation and configurations leading to potential Safety hazards. Based on current layout and staging design this point will be after the stages 3C&D.

As part of this waiver, LIRR is requesting to delay the introduction of the ACSES II PTC system until the Harold layout is stable or with minimal changes affecting the PTC functionality. As per the 49 Code of Federal Regulations (CFR) §236.1035 all existing routes at the time of the cutover of stage 3C&D will be equipped with ACSES II equipment including Transponders, WIU and Wayside Communications equipment. The proposed high-level timeline for the commissioning of the ACSES II PTC system in this area is shown in the diagram below.

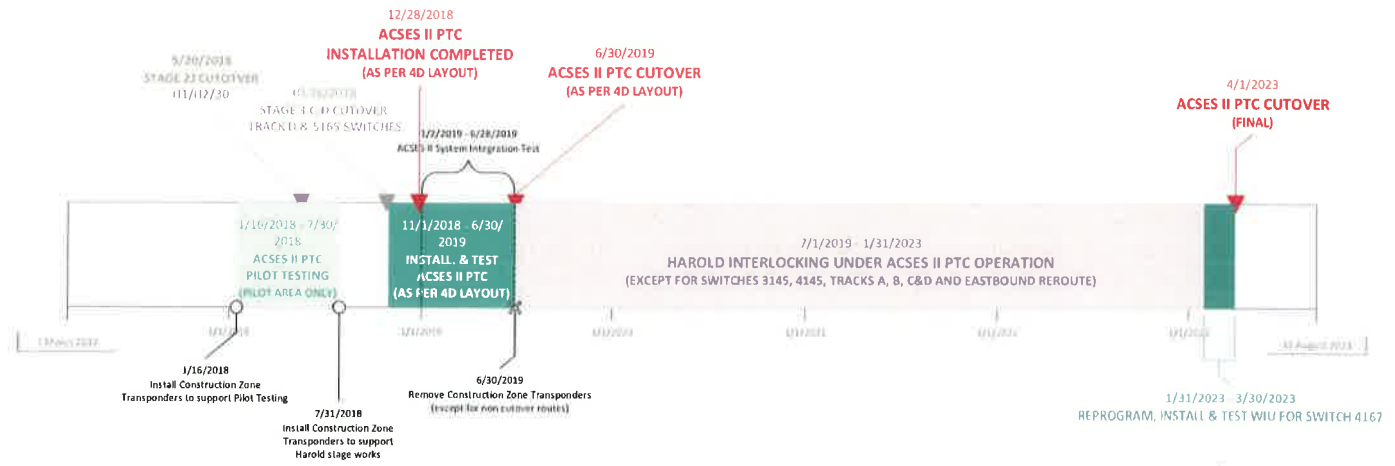


Figure 2 Harold ACSES II PTC Cutover High Level Timeline

The main target milestones for the installation and cutover of the ACSES II PTC system are:

- Installation of Construction Zone Transponders to enable Pilot Testing: 1/16/2018
- Installation of Construction Zone Transponders to support the remaining Harold Stage works: 7/31/2018
- Complete the installation of the Transponders, WIU and Wayside Communications sites as per final layout: 12/31/2018. As the stage 3C&D track layout reconfigurations are completed, the ACSES II equipment will be installed on the areas where no additional works are planned.
- Initial cutover of ACSES II PTC on Harold: 6/30/2019. Testing of the ACSES II PTC system is will be completed between 1/2/2019 and 6/29/2019. All existing routes will be cutover for revenue service under ACSES II PTC system operation.
- Final cutover ACSES II PTC on Harold (updates to match final layout (4D)): 4/1/2023. As the track layout works are completed, the Transponders, WIU and Communications equipment will be installed and tested so the ACSES II PTC system can be put in revenue service as part of the interlocking cutover.

Under this concept, if approved by FRA, and in the absence of unforeseen ESA schedule delays, all of today's train movements on LIRR's Main Line through "Harold" including Amtrak routes to and from the Hell Gate Line would be fully PTC compliant by the summer of 2019. The ESA routes to and from ESA GCT will be fully PTC compliant when the routes open for revenue service. In essence the waiver is a 6-month delay in the cutover of full PTC from the December 2018 mandate, however as required by 49 Code of Federal Regulations (CFR) §236.1035 all PTC equipment will be installed on or before December 31st 2018. It is noted that throughout the Harold staging, LIRR's cab signal and Automatic Train Control (ATC) system will provide for PTC protections except as can occur from Stop Signal violations and temporary speed restrictions.

4 Description of changes per stage

4 major stages with a total of 16 sub-stages are planned to complete the Harold interlocking reconfiguration. At the time of creation of the initial version of this document Stage 2F is cutover. In this document details for the remaining stages are provided.

This section describes the modifications made to the existing routes to achieve the planned track layout. This section doesn't describe the rollout of the ACSES II PTC system, for details please go to section 5.

4.1 Stage 2I

The Stage 2I cutover is focused on the H5, H6 and Location 30 CILs.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

During this stage only the Transponders, WIU and Wayside Communications equipment serving the LIRR Pilot L2 (Port Wash Track 1) will be installed.

4.1.1 Track Changes.

On stage 2I the New Main Line (ML) 4 track will be configured as per its permanent alignment. No tracks are removed on this stage.

4.1.2 Switch changes.

The following switches will be cut in:

- 4178 E/W
- 6156 E/W
- 6167 E/W
- 6176 E/W
- 6776 MPF

The following switches will be removed:

- 5167 E/W (863)
- 5178 (865)
- 4276 E/W (843)

4.1.3 Signal changes.

As part of this stage, the following signals are added:

- 55E
- 56E
- 57E
- 16-4
- 55W
- 56W
- 57W
- 21-4
- 65E
- 66E
- 67E
- 68E
- 68W

- 22-4
- 24-2
- 24-4
- 67W
- N24
- 66W
- NY44-2
- 65W
- N30
- 30-2
- 30-4
- 31-2.

The following signals are removed during this stage:

- 856E
- 858E
- 860W
- 856W
- 858W
- 858WC
- 862EA
- 18
- N18
- NY2.48
- N30
- 30-2
- 30-4
- 31-2.

4.2 Stage 2J

The Stage 2J cutover affects the H1, H2 and Location 30 CILs

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

Construction Zone transponders will be installed in all tracks leading to the Harold interlockings to prevent any train operated under ACSES II PTC either under test or Revenue Service Demonstration to operate in the Harold territory while changes in the track layout are made.

4.2.1 Track Changes.

No tracks are added or removed during this stage.

4.2.2 Switch changes.

The following switches will be cut in:

- 3234 E/W

The following switches will be removed:

- 803 E/W
- 805 E/W

The following switch will be renamed during this stage:

- 801 renamed to 1121.

4.2.3 Signal changes.

As part of this stage, the following signals are added:

- 25W
- 22W
- 23W
- 24W
- 24WC
- 12E
- 13E
- 14E
- 13W
- 14W
- 11W
- 12W
- PW1E
- NY44-1
- N31
- 31-1
- 31-3
- 30-1.

The following signals are removed during this stage:

- 808W
- 810W
- 812WA
- 812WC
- 800E
- 806E
- 804E
- 802W
- 804W
- 872E
- 22N
- N31
- 31-1
- 31-3
- 30-1.

4.3 Stages 3 A&B

On Stages 3 A&B the NEQ, the WBY and Track A are cutover.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

As track works are finalized the associated Transponders, WIU and Wayside Communications equipment will be installed.

4.3.1 Track Changes.

Track WBY is introduced as part of this stage. No tracks are removed.

4.3.2 Switch changes.

The following switches will be cut in:

- 1121 E/W Route over 1121E normal is disabled until WBY is completed.
- 1112 E/W
- 1134 E/W
- 1123 E/W Blocked N until WBY is completed.
- 835 Blocked N until WBY is completed.
- 3132 E/W
- 3121 E/W Circuitry cutover/pinned N. Sw's installed in 2019 & blocked N until WBY is completed.
- 3111E Circuitry cutover/pinned N. Sw installed in 2019 & blocked N until WBY is completed.
- 2122 Blocked N until Track A is in service completed.

The following switch will be removed:

- 1121 Turnout (formally 801) relocated as 1121 E/W.

4.3.3 Signal changes.

As part of this stage, the following signals are added:

- 832WD Hold applied until WBY is completed
- 31EC Hold applied until WBY is completed
- 31EA Hold applied until WBY is completed
- 31W Hold applied until WBY is completed
- 11E Hold applied until WBY is completed
- 20E Hold applied until Track A is in service

No signals are removed as part of this stage.

4.4 Stages 3 C&D

The works on stages 3 C&D are focused on Track D and the 5165 switches. At the completion of 3D cutover, LIRR plans to commence installation of ACSES transponders and final ACSES data radio locations and cabling.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

As track works are finalized the associated Transponders, WIU and Wayside Communications equipment will be installed. All routes will be equipped although not cutover by end of December 2018.

4.4.1 Track Changes.

No tracks are added to service in stages 3C or D. The Engine Track is removed as part of the cutover.

4.4.2 Switch changes.

The following switches will be cut in:

- 6197 E/W Blocked N until Tunnel D is in service
- 6198 Blocked N until Tunnel D is in service
- 6199 Blocked N until Tunnel D is in service
- 5165 E/W WB route disabled over 5165E until 4145/3145 sw's are in service

As part of this cutover the following switches are removed:

- 855 E/W 855W removed and 855E Blocked R until end of Stage 3D for train moves
- 2145 E/W (821) Removed during various stages of 3C/D
- 2254 E/W (811) Removed during various stages of 3C/D
- 2144 Removed during various stages of 3C/D
- 4165 (813) Removed during various stages of 3C/D

4.4.3 Signal changes.

As part of this stage, the following signals are added:

- 2-36 Hold applied until Tunnel D is in service
- 2-39 Hold applied until Tunnel D is in service

One signal is removed as part of this stage:

- 24WC When Engine Track is removed

4.5 Stage 4B

The works on stage 4B introduces switches 3145 and 4145.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

As track works are finalized the associated Transponders, WIU and Wayside Communications equipment will be installed.

4.5.1 Track Changes.

No tracks are added or removed during stage 4B.

4.5.2 Switch changes.

The following switches will be cut in:

- 3145 Route between WWD LI Pass & AMT 2 in service
- 4145 Route between WWD LI Pass & AMT 2 in service

No switches are removed on this stage.

4.5.3 Signal changes.

No signals are added or removed during stage 4B

4.6 Stage 4 C

The works on stage 4 C introduces Tracks A, B/C and D as well as switch 1143.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

4.6.1 Track Changes.

Tracks C&D are introduced as part of this stage. No tracks are removed during this stage.

4.6.2 Switch changes.

The following switches will be cut in:

- 1143 E/W
- 2154
- 2155
- 2154
- 5155

As part of this cutover the following switches are removed:

- 841 Replaced by relocated 4167

4.6.3 Signal changes.

No signals are added or removed during stage 4C.

4.7 Stages 4 D (Final)

Stage 4D is the final planned stage for Harold. This stage is focused on the introduction of the Eastbound Reroute.

On the F interlocking, the 745, 735 E/W, 743 E/W and 741 switches are reconfigured.

The following changes to the Harold Layout are introduced on this stage.

See attachment A for detailed layouts.

As track works are finalized the associated Transponders, WIU and Wayside Communications equipment will be installed. All routes will be equipped and tested prior the cutover of the newly added routes.

4.7.1 Track Changes.

The Eastbound Reroute is cut over on this stage. No tracks are removed.

4.7.2 Switch changes.

The following switches will be cut in:

- 4167 E/W
- 2254 Route from EBBR to WWD LI Pass
- 4154

No switches are removed on stage 4D.

4.7.3 Signal changes.

As part of this stage, the following signals are added:

- 12-5
- 45EA
- 45WA

No signals are removed on stage 4D.

5 Proposed ACSES II PTC implementation strategy

As specified in the LIRR PTCIP, the validation of the ACSES II PTC system will be completed on the 2 designated Pilot Lines. The Pilot Line 1 extends from the eastern limits of Babylon Interlocking to the western limits of PD Interlocking. The LIRR Pilot Line L2 extends from the eastern limits of Harold including the routes to and from Amtrak's Hell Gate to Port Washington including Port Wash Yard and Shea yard as well as the Jamaica JCC Office PCC. Testing will utilize the following LIRR locomotive and cab car types: M7, M9, DE30, DM30, SW1001, MP15, and C3 Cab equipped with ACSES II hardware and software and configured to communicate to the LIRR wayside and office. In addition to the LIRR rolling stock, New York and Atlantic Railroad (NYAR) SW1001, MP15, and GP-38 locomotives will be equipped and tested on the LIRR PTC system. Amtrak trains will be operating as a tenant on sections of the Harold interlocking belonging to Pilot L2.

The complete validation of the system requires access to the areas under reconfiguration on the Harold territory.

The original approach for the implementation of the ACSES II PTC on the Harold interlocking was based on a staged approach matching the various Harold construction stages. This way, an installation was planned for Harold Stage 2F then another update for Stage 2J in where the ACSES II PTC system would be cutover and from this point and on a reconfiguration of the Transponders, WIU and Database will be made for each of the intermediate stages (3A/B, 3C/D, 4B, 4C and 4D). For every intermediate stage both database and physical location changes were required. This approach presents significant challenges both from a Configuration Management as well as from a Safety assurance standpoint.

To minimize potential Safety hazards and simplifying the Configuration Management of the ACSES II PTC system and in general the LIRR operations, a strategy based on a (1) single installation and cutover plus a final update as the new routes are finalized is proposed. In this approach, the ACSES II PTC system will be designed for the final layout (Stage 4D) and will be installed, tested and cutover at a stage in where there are minimal changes affecting the Transponders and WIU database after that point in time. In reviewing the layout changes necessary for each of the stages, it is determined that the installation of the Transponders and WIU will be executed as routes are finalized in parallel with the works for stage 3C&D finalizing the remaining routes right after the interlocking cutover.

To protect trains entering ACSES territory from LIRR on the east, Amtrak on the west, plus Amtrak's Hell Gate line, redundant Construction Zone transponders will be placed. These transponders will also deactivate ACSES onboard enforcement while trains are within Harold. All possible entries will be bounded with Construction Zone Transponders. For testing purposes, trains will enter Construction Zone first and then once in the designated testing area, trains will be cycle power to regain ACSES mode operation. Once testing is finalized trains will leave the territory through Construction Zone Transponders.

The timeline diagram below shows the major milestones and activities for the introduction of the ACSES II PTC system.

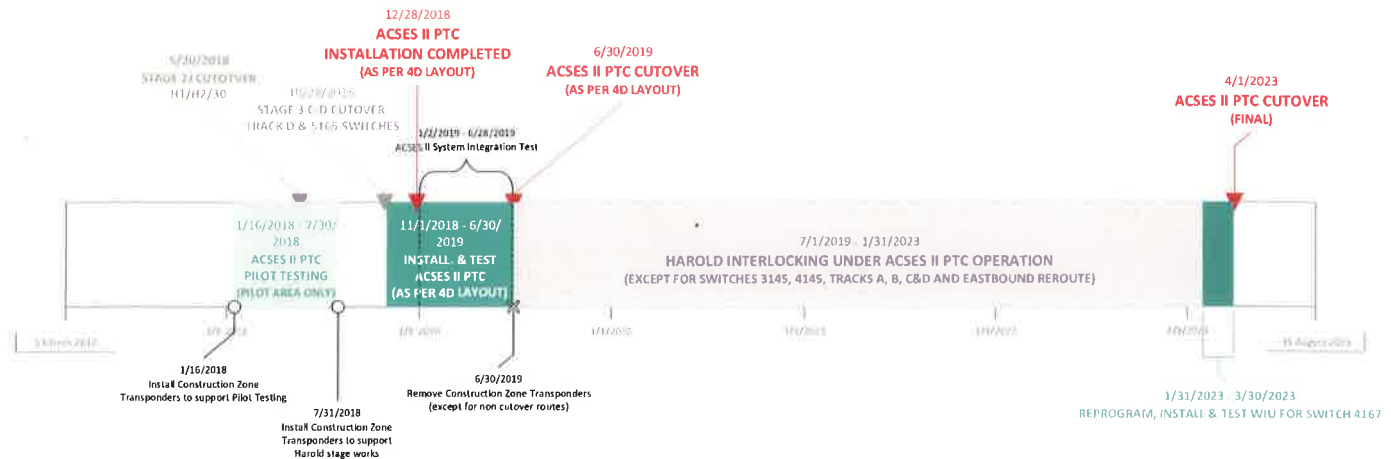


Figure 3 Harold ACSES II PTC Cutover High Level Timeline

The following sections describe the specific Construction Zone transponder layouts and the planned system operation during each of the identified periods.

Attachment B includes the layouts presented in this section.

5.1 Configuration for Pilot Testing

Target dates: 1/16/2018 to 7/30/2018

For Pilot Testing, LIRR will isolate the tracks required for completing the necessary interface test with Amtrak. At the time of the test, the track layout will be as per the stage Harold 2F layout.

The Pilot Line testing will be conducted on the Port Washington Branch Track 1 eastward of signal 808E (future 22E) including switch 801 for accessing Amtrak track 1 towards Gate interlocking. Switches 803, 807, 815 and 817 will be monitored as part of the Pilot Testing scenarios. The Port Washington Pilot Lines Track 1 testing will be extended till the end of the branch at the Port Washington yard. For Track 2 the limits will be signal N30 at the Woodside Interlocking and the end of track 2 at Neck 2 Interlocking. Transponders, WIU and Wayside Communications equipment will be installed in all available routes.

The following diagram shows a representation of the Harold interlocking. The tracks highlighted in orange represent the tracks in where ACSES II PTC is possible. Tracks in grey are for tracks under construction changes and as such there is no ACSES operation possible.

Construction zones are denoted by red triangles (Cz) and regular transponders are represented as yellow triangles showing the anticipated number of transponder units within the set.

The diagram shows the locations in where WIU will be installed (see green circles) and the anticipated locations for the 220MHz Wayside Communications Radio locations.

The following diagrams are not to scale and presents a high-level conceptual design of the ESA/Harold Interlocking used for illustration purposes only. Final drawings will be released once the Transponders and WIU design is completed.

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Revision : A

HAROLD (Stage 2F Layout) configuration during Pilot Testing
[01/16/2018 - 07/30/2018]

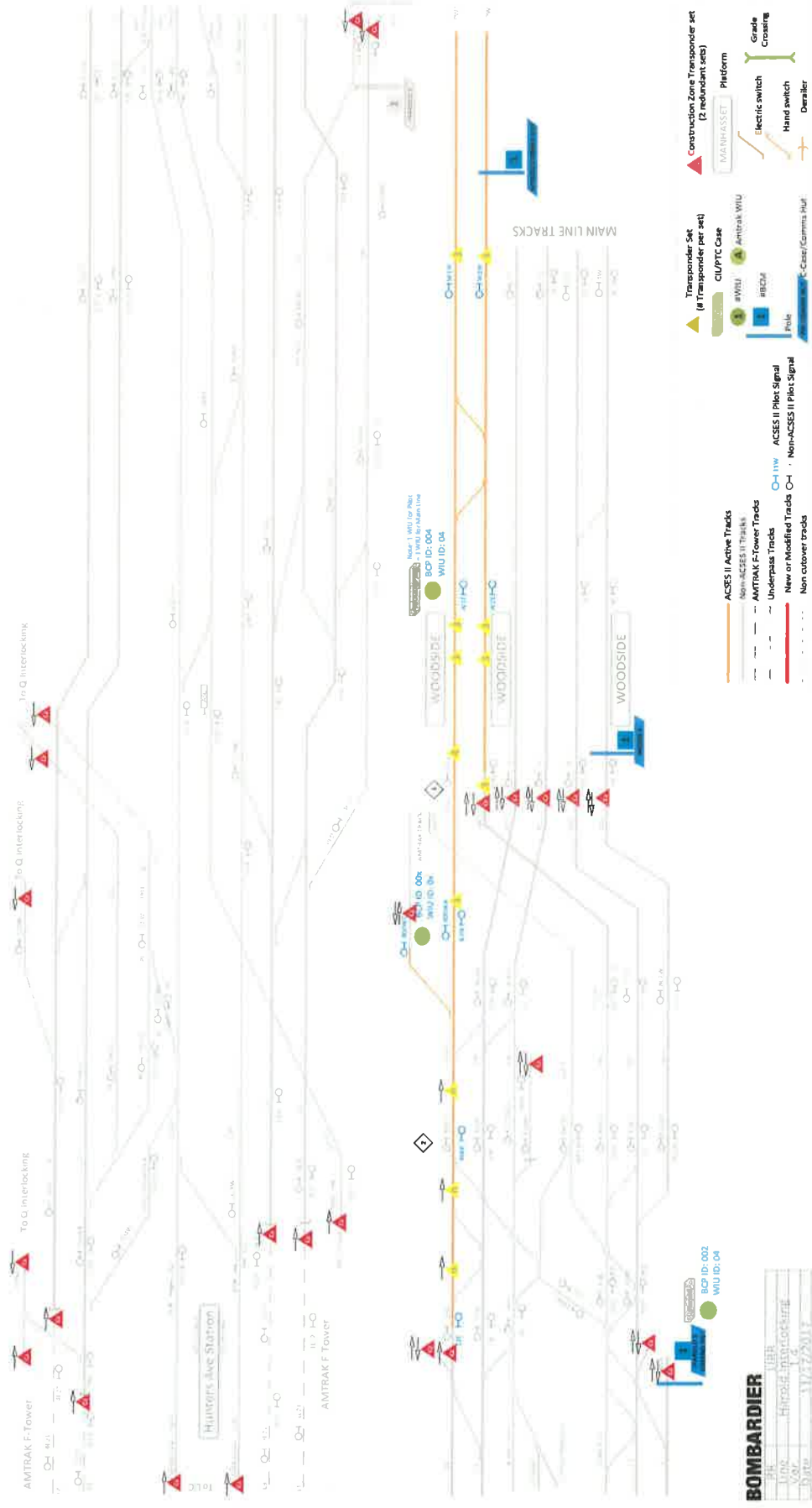


Figure 4 Harold 2F, Configuration during Pilot testing

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Template Instruction ID-Number: 006736

As described, Construction Zone transponders will be installed to prevent trains entering ACSES Mode on the designated Pilot Line areas. Test Trains will be cycle power once the Construction Zone Transponders have been completely cleared, this way the train will enter ACSES mode when reading the next Transponder Set in its route.

For Eastward movements on Port Washington Track 1, Construction Zone transponders will be installed East of Signal 22E (after switch 817W) to provide sufficient space for reading the Construction Zone Transponders and the necessary PDS and DS transponders required for signal 800E. For Port Washington Track 1 Westward routes, the construction zone transponders will be installed West of signal 808W. For both Eastwards and Westwards movements on Amtrak Track 1, construction zones will be installed East of signal 800WC. The installation of these Construction Zone transponders will be coordinated with Amtrak.

For Pilot Testing on Port Washington Track 2, Construction Zone transponders will be installed West of Signal N30. No Test is planned beyond this signal.

To eliminate the possibility of an equipped train entering ACSES mode on any of the non-Pilot tracks, Construction Zones transponders will be installed at:

- Eastward approaches of Signal bridge 31 on tracks ML3, ML1, ML2 & ML4
- East of Signal 804E
- Spur Tracks West of signal 858E and ML4
- Spur Tracks West of signal 32W and 22E on Port Washington Track 1
- East of Signals EL2 and EL1
- Entrances from Q Interlocking
- East of signal 822EA and 828E
- East of signal 826E
- East of Signal 736E and 742E
- East of Signal 708E and 712E

Attachment B includes the layouts presented in this section.

5.1.1 Testing activities

Once completed all the ACSES II Installation works and Installation acceptance activities, ACSES II System Integration Test will commence. All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Each Construction Zone transponder set will be tested as prescribed by the Site Installation Test Plan including PICO (Post Installation Check Out) Test and SFT (Site Functional Test). Once the installation tests are completed, an train equipped with ACSES II PTC System is run over the transponders to ensure proper activation of the Construction Zone mode.

The planned Pilot Testing activities include both Functional and Performance/Integration tests. After the successful completion of the Site Installation Test, the Site Performance Test (SPT) will commence.

The SPT program is designed to verifying and validating the System Functionality. Specific Test Scenarios are developed to verify the proper implementation of the System Level Functions and System Level Requirements. For the Harold section of the Pilot Lines due to its limited extension and significance in terms of Interoperability, the focus of the testing will be:

- Demonstrate ACSES II PTC functions:
 - o ACSES II Modes of operation,
 - o Vitally encoded Transponders data,
 - o PTS,
 - o PTSO,
 - o Data Radio Transmission,
 - o OBC location report,
 - o TSR Enforcement,
 - o Turnback
 - o Stopping accurately at stations close to HS
 - o TSR through junctions
- Demonstrate Railroad Boundary specific and interoperability functionality between LIRR and Amtrak:
 - o Line Boundaries (both at Wayside and Office level)
- Validate the ACSES II Database for the area under test.
- All other ACSES II PTC System Level functionalities are tested throughout both Pilot Lines as described on the Pilot Program Plan [10] and LIRR FRA Test Waiver Request [8].

Following the completion of the SPT tests, the Site Integrated System Tests (SIST) will be conducted. The SIST are intended to demonstrate the proper operation and performance of the integrated system. In these test, complex, load/capacity and time-based scenarios are executed. In the case of Harold, the testing will be focused in the validation of the interface with Amtrak and how different timing and failure mode situations affect the proper interaction of both LIRR's and Amtrak's systems.

As part of the SIST, End to End runs will be conducted with both LIRR and Amtrak trains to ensure proper operation and readiness for Revenue Service Demonstrations.

After completing the SIST and in case necessary the regression testing for closing open Variances, the ACSES II PTC System is ready for Revenue Service Demonstrations.

5.1.2 Operational Restrictions and Training

During this period, only the designated Pilot Trains will be authorized to operate under ACSES mode on the designated Pilot Line tracks. Once the Pilot trains move out of the Pilot area will enforce the Construction Zone limitations. Operation will be as prescribed on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Non-Pilot Trains will operate at all times with ACSES in cut out to prevent enforcing ACSES operation on the equipped tracks. In case trains are operated with ACSES in cut in, trains will not be power cycled within the limits of the Harold interlockings. Should a cycle power be required within the limits of the Harold interlocking the Engineer will set ACSES to cut out.

Appropriate signage will be installing on the entrances to the Construction Zone area to inform the Engineer, likewise, the areas where ACSES operation is allowed will be identified by appropriate signage.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout and Construction Zone areas. Detailed safety briefings will be conducted prior to the execution of any field installation or testing.

Tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

5.2 Configuration after Pilot Lines

Target dates: 7/31/2018 to 10/30/2018

Once the Pilot Testing has been completed on the Amtrak RR boundary and the necessary ACSES II functionality has been fully proven in the Pilot Territory, the Port Washington Track 1 section East of signal 800E and West of Signal N31 including switch 801 and signal 800WC will be removed from ACSES II PTC service. This area will be limited with Construction zone transponders. This step is necessary to allow for the expected track layout changes planned for Harold Stage 2J.

In addition to the existing Construction Zone Transponders, a new set of Construction Zone Transponder will be installed East of signal N31 on Port Washington Track 1.

3051476

Revision : A

HAROLD (Stage 2J Layout) configuration after Pilot Test to support Harold staging works.
[07/31/2018 – 10/30/2018]

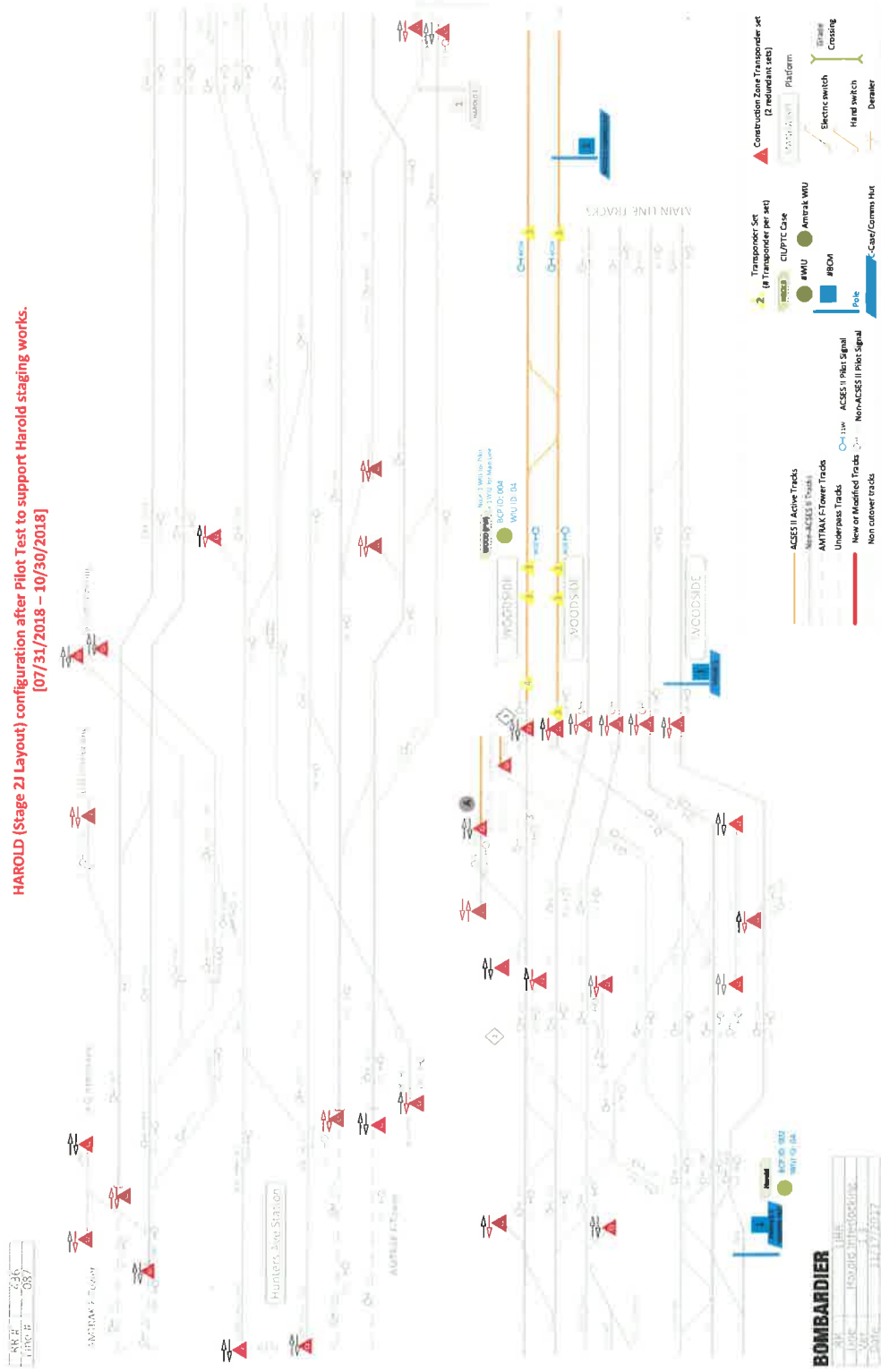


Figure 5 Harold 2J, Configuration after Pilot Test to support Harold Staging works

5.2.1 Testing activities

For this stage, only Construction Zone Transponders are installed, not other ACSES II PTC equipment or territory is equipped.

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Each Construction Zone transponder set will be tested as prescribed by the Site Installation Test Plan including PICO Test and Site Installation Test. Once the installation tests are completed, an equipped train is run over the transponders to ensure proper activation of the Construction Zone mode.

No additional System Level Functional, Performance or Integration test are planned for this period.

5.2.2 Operational restrictions and Training

At this point in time, Revenue Service Demonstrations will be run on the Port Washington Branch up to signal N30 & N31 To prevent equipped and active trains reading and enforcing transponders outside the designated territory (East of signal W1E and W2E in Woodside), Construction Zone transponders will be installed. Appropriate signage will be installed to inform the Engineers on the entry/exit points.

Operation and testing will be as prescribed on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9]. Non-Pilot Trains operating within the limits of the Harold interlockings will operate at all times with ACSES in cut out to prevent enforcing ACSES operation on the equipped tracks. In case trains are operated with ACSES in cut in, trains will not be power cycled within the limits of the Harold interlockings. Should a cycle power be required within the limits of the Harold interlocking the Engineer will set ACSES to cut out.

As construction works will be ongoing while in this configuration, periodic inspections of the Construction Zone Transponders will be made to ensure proper operation and enforcement.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout and Construction Zone areas.

5.3 Configuration during ACSES II installation on new available routes

Target dates: 07/31/2018 to 6/30/2019

The installation of the Transponders, WIU and Wayside Communications Radio sites for Harold interlocking will be initiated as the planned works for each route are completed. For tracks completed right before the cutover of Harold Stage 3C&D installation will be completed after the cutover. All available routes will be equipped with Transponders, WIU and Wayside Communications Radio sites before December 31st 2018.. The remaining layout modifications after this stage are limited to the addition and or modification of switches 3145, 4145, 1143E/W, 2154, 2155 and 5155 as well as the introduction of the Eastbound reroute. Although the changes are significant, they are compatible with the required Transponder Layout for the final stage (4D). ACSES will be designed based on the final track layout configuration and installed as tracks are made available. No trains will operate through the incomplete stage areas.

The Harold Transponders design will account for the tracks and switches planned for the final Harold layout (4D) however the WIU inputs for the affected routes will be disconnected to avoid transmitting non-possible routes and distances to the trains as part of the ISR responses.

Construction Zone transponders will be maintained throughout the installation process to avoid any active ACSES train reading the new transponders. New Construction Zone transponders might be required to accommodate any track layout reconfiguration to be worked during the installation of the Transponders and WIUs. All transponders will be installed in place except for the ones belonging to the tracks to be modified during Stages 4B, 4C & 4D. This applies to both the LIRR and Amtrak tracks.

Functional Testing will commence after the installations and Site Installation Test for Transponders, WIU and Radio Sites are completed.

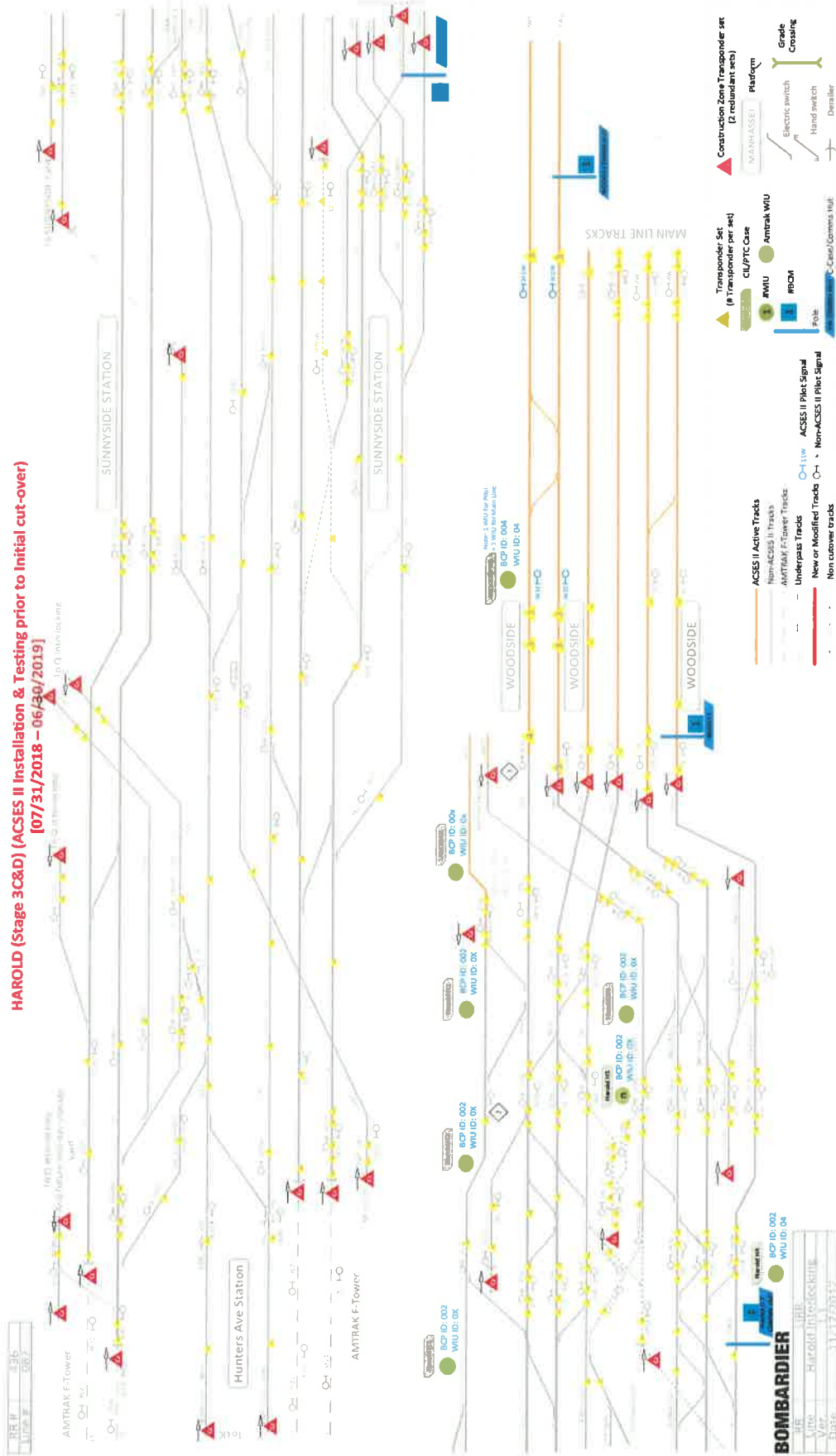


Figure 6 Harold Stage 3C&D layout (ACES II Installation & testing prior to cut-over).

5.3.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

The ACSES II Transponders, WIU and Wayside Communications Radio site equipment installation will be executed as described on the Site Installation Test plan. After the physical installation, PICO test, SFT (Site Functional Test) and a subset of the Site Performance Test (SPT) and Site Integrated System Test (SIST) is conducted on the newly installed area. This approach is applicable to all segments after successful completion of the Pilot Testing Program.

The subset of functionality tested corresponds to a 20% of the Test Scenarios developed for the Pilot Lines System Level test and includes all Core ACSES II PTC functions both from a Functional and Performance standpoint.

For Construction Zone transponder sets PICO Test and Site Functional Test will be conducted. Once the installation tests are completed, an equipped train is run over the transponders to ensure proper activation of the Construction Zone mode.

In the specific case of Harold, on top of the planned testing subset, additional boundary testing and Amtrak interoperability test will be conducted to ensure proper operation of both LIRR and Amtrak throughout the Harold territory.

After completing the SIST and in case necessary the regression testing for closing open Variances, the ACSES II PTC System is ready for Revenue Service Demonstrations

5.3.2 Operational restrictions and Training

Like previous stages and since new segments and train fleets will be under Revenue Service Demonstration, to prevent equipped and active trains reading and enforcing transponders outside the designated territory (East of signal W1E, W2E, 2E and 4E in Woodside and Signal Bridge 31), Construction Zone transponders will be installed. Appropriate signage will be installed to inform the Engineers on the entry/exit points.

Operation and testing will be as prescribed on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9]. Non-active ACSES Trains operating within the limits of the Harold interlockings will operate at all times with ACSES in cut out to prevent enforcing ACSES operation on the equipped tracks. Should a cycle power be required within the limits of the Harold interlocking the Engineer will set ACSES to cut out to prevent reading of the installed and not verified transponders.

As construction works will be ongoing while in this configuration, periodic inspections of the Construction Zone Transponders will be made to ensure proper operation and enforcement.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout and Construction Zone areas. Detailed safety briefings will be conducted prior to the execution of any field installation or testing.

Tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

5.4 Harold Initial cutover

Target dates: 7/1/2019 to 1/30/2023

Upon successful completion of the Field Integration Tests as prescribed by the Master Test Plan, the Harold interlockings will be ready for its cut over and commence the Revenue Service Demonstrations on the available routes.

As described in previous sections, the entire interlocking except for the switches 3145, 4145, 1143E/W, 2154, 2155 and 5155 as well as the introduction of the Eastbound reroute will be cut over at once.

To complete the cutover, LIRR will remove all installed Construction Zone transponders bounding the entry and exit of the Harold interlockings. The following Construction Zone Transponders will be maintained to prevent any train operating on the switches and tracks under civil works throughout Stages 4B, 4C and 4D reading the equipment installed in them.

Once the Construction Zone Transponders are lifted, operation under the premises of the Revenue Service Demonstration test will be conducted to ensure proper operation of the system.

An updated LIRR PTCSP will be submitted to FRA for review and approval.

Revision: A

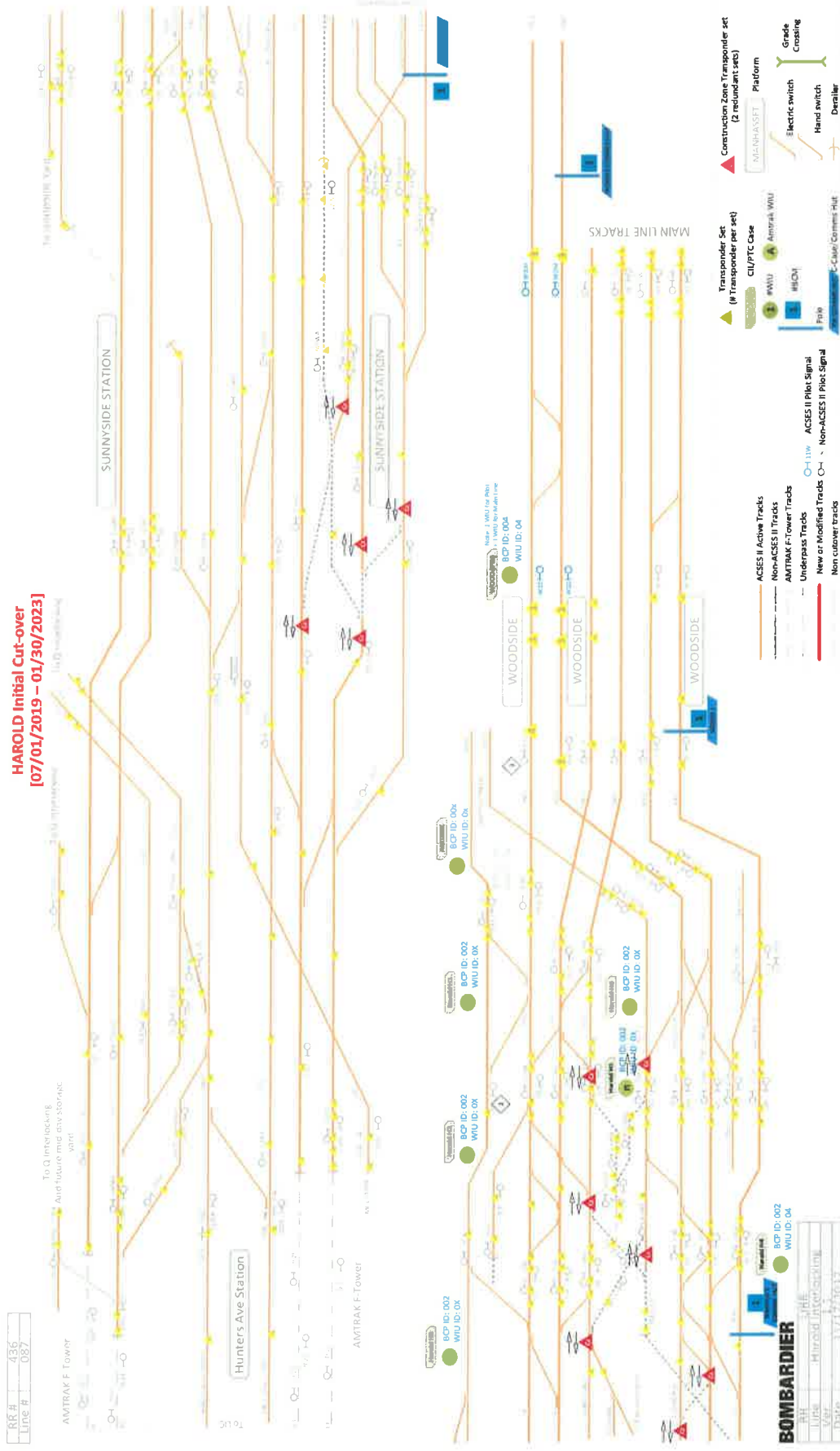


Figure 7 Harold Initial cutover

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5.4.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Prior to the cutover of the ACSES II PTC system and after having completed the Field Test program (see section 4.3.1), End to End runs of both LIRR and Amtrak trains (on available routes) will be conducted to ensure the System operation is stable and ready for cutover.

5.4.2 Operational restrictions and Training

Appropriate signage will be installed to inform the Engineers of the areas under ACSES II PTC system operation and the ones still to be activated.

As construction works will be ongoing while in this configuration, periodic inspections of the Construction Zone Transponders will be made to ensure proper operation and enforcement.

Coordination with Amtrak will be required to ensure proper interoperability throughout the Harold Interlockings.

No other operational restrictions will be required once the ACSES II PTC system Revenue Service Demonstration period is completed.

All train Engineers and maintenance personnel will be briefed on the new signage and operational procedures derived from the updated layout Modes of Operation and Construction Zone areas. Train Engineers must be trained on the Operation of the ACSES II PTC System prior to operating a train on the cutover section.

All tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

5.5 Harold Final cutover

Target dates: 1/31/2023 to 3/30/2023

The final step to complete the cutover of the Harold interlocking as per its final layout is to install and test the switches 3145, 4145, 1143E/W, 2154, 2155 and 5155 as well as the Eastbound reroute introduced during Stages 4B, 4C and 4D. From an ACSES II PTC System the remaining works are to install the Transponders on the finalized tracks, to validate the WIU and Wayside Communications and to validate the ACSES II Database for the routes to be introduced as part of this final cutover. Transponders and WIU adjacent to the new routes will be reprogrammed to match the final layout.

Approximately 2 months before the planned Harold Stage 4D cutover, a reprogramming of the WIUs and Transponders serving the switches 3145, 4145, 1143E/W, 2154, 2155, 5155 and the Eastbound reroute will be completed. On top of the Transponders and WIU updates, it is anticipated an update to the Office Database. Construction Zone Transponders will be maintained during the reprogramming and testing activities.

Once the prescribed testing program is completed and making it coincident with the planned Harold Stage 4D cutover, the remaining Construction Zone transponders will be dismantled completing this way the cutover of the ACSES II PTC system.

All new routes will include ACSES II PTC at the time of the cutover.

Prior to the cutover, an updated LIRR PTCSP will be submitted to FRA for review and approval.

Revision: A

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5.5.1 Testing activities

All testing will be executed as described on the LIRR FRA Test Waiver Request [8] and the Conditional approval LIRR test waiver request [9].

Prior to the cutover of the ACSES II PTC system and after having completed the Field Test program (see section 4.3.1), End to End runs of both LIRR and Amtrak trains (on applicable routes) will be conducted to ensure the System operation is stable and ready for cutover.

For this stage updates to the Transponders Telegrams and WIU configurations are required, once updated, Site Functional Test (SFT) will be run for the affected equipment to ensure proper operation and readiness to support both the Site Performance test (SPT), Site Integrated System Test (SIST) and final End to End runs.

The subset of functionality tested corresponds to a 20% of the Test Scenarios developed for the Pilot Lines System Level test and includes all Core ACSES II PTC functions both from a Functional and Performance standpoint.

At this point, all Construction Zone transponders are removed as such no specific testing is required. The End to End runs conducted as part of the SIST will verify that proper Mode of Operation is maintained throughout the Harold interlockings.

For the final cutover, there is no need of testing the RR boundaries as this is not affected by the layout changes introduced as part of the Harold Stages 4B, 4C and 4D.

After completing the SIST and in case necessary the regression testing for closing open Variances, the ACSES II PTC System is ready for Revenue Service Demonstrations

5.5.2 Operational restrictions and Training

All temporary signage will be removed once the cutover is completed.

Coordination with Amtrak will be required to ensure proper interoperability throughout the Harold Interlockings.

No other operational restrictions will be required once the ACSES II PTC system Revenue Service Demonstration period is completed.

Tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

6 Operational Considerations

The LIRR PTC Implementation Plan (PTCIP) Rev 3.0 developed in fulfillment of 49 CFR Part 236, Subpart I, 236.1011 along with the LIRR Operating Concepts provides a description of the applicable Operational Considerations including a list with complete descriptions of all functions which the PTC system will perform to enhance or preserve safety as required by §236.1013(a)(3). The concept of operations is organized generally in accordance with Institute of Electrical and Electronics Engineers (IEEE) standard 1362-1998. It describes ACSES II functionality, operation and characteristics generally from the user's perspective. A limited description of the internal workings of the system is included in some sections where it augments understanding of observable system behavior.

A revised LIRR PTC Implementation Plan (PTCIP) including the proposed Harold staging will be submitted to FRA.

For each of the planned ACSES II PTC System cutover an updated LIRR PTC Safety Plan (PTCSP) will be submitted to FRA.

7 Description of Measures of Protection and Test Procedures– §236.1035(a)(3)

As always, safety and protection of the public comes first and is of the utmost importance during these Field-Testing proceedings. In order to protect the test train crew, and all involved with the testing, LIRR will use the following measures of protection:

- A job briefing will be conducted with each affected employee, contractor and/or observer prior to each Field Test to ensure that every individual clearly understands the test to be conducted and the movements to be made in support of that test.
- To facilitate testing of predictive or reactive enforcement of Temporary Speed Restrictions (TSR), the Test Manager may construct and convey speed restrictions to the ACSES II PTC system for test purposes through the use of simulation tool(s).
- To facilitate testing of Work Zone requirements, the Test Manager may construct and convey Work Zone Bulletin Line items to the ACSES II PTC system for test purposes through the use of simulation tool(s).
- To facilitate testing of Movement Authorities, the Test Manager may construct and convey Stop Release Push Button, Authority to Pass Signal Displaying STOP Indication, or Track Authority to the ACSES II PTC system for test purposes through the use of simulation tool(s).
- To facilitate predictive and reactive enforcement of signal indications, operating procedures will be in place to permit the test train to safely pass a signal displaying an indication being tested, or the indication may be simulated at a signal actually displaying a more permissive aspect.
- If required, an absolute block will be utilized for tests that require the testing of moving equipment. This requirement will be evaluated on a test by test basis.
- All tenant railroads will be notified in writing that PTC testing will be taking place well in advance of the scheduled test dates. Prior to tenant testing, the tenants (NYAR and Amtrak) will need to provide fitted trains for testing. Tenant crews will also need to be provided to operate the tenant trains during the test and receive training prior to the test. Amtrak MoW crews will also be required to assist in interfaces near the boundary. During TSR testing PSCC Dispatchers will need to be provided to test Adj. RR TSR functionality.

8 Testing's Effect on Current Method of Operation –§236.1035(a)(7)

ACSES II PTC testing will have no effect on the current Method of Operation on the Harold interlocking while the PTC system is under installation or test.

9 Final Recommendation

The waiver request that the new LIRR ACSES II PTC System be cutover following the ESA completion of stages 3C and 3D. This should be completed by late October 2018, with testing and commissioning completed by June 2019. All necessary ACSES II PTC equipment will be installed in all routes existing by December 2018. Due to facts that the PTC project is driven by the ESA Project Schedule, any delay in the ESA Schedule could result in a delay in the PTC completion date. The PTC project will make every effort to meet the June 30, 2019 date and will keep FRA updated as these dates get closer.

Attachment A

(Signal Block Layouts 10-10-15rev1)